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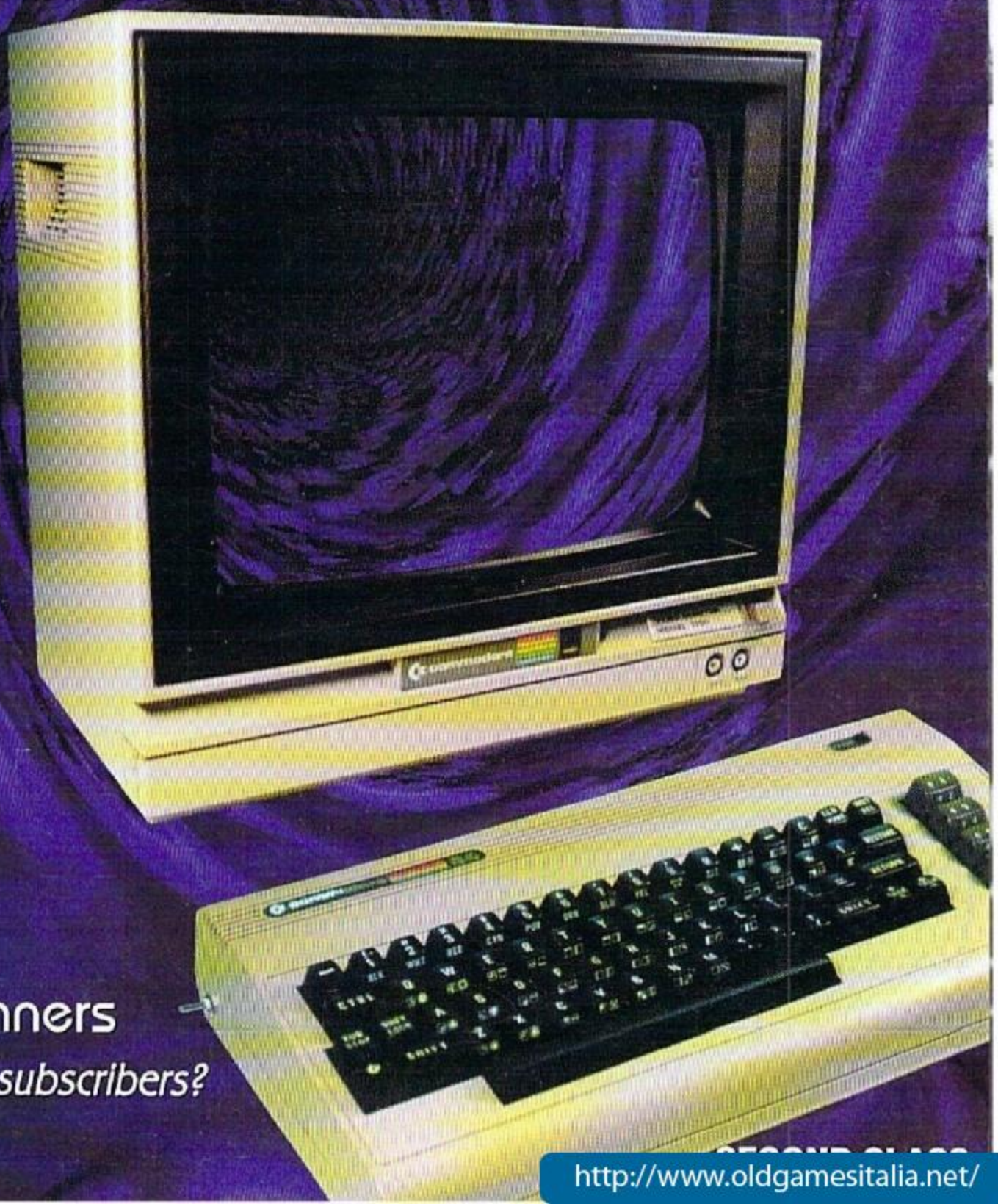

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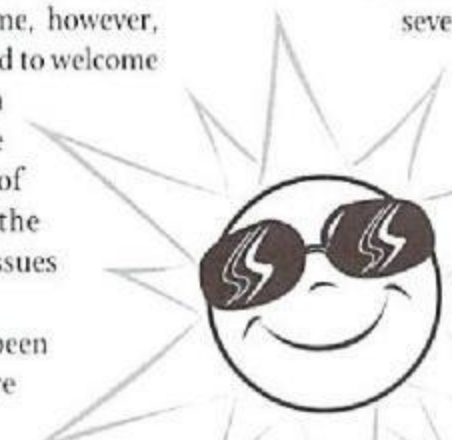
From The Editor

As the warm rays of summer sun shine down on the world outside, and as many of you enjoy your vacations, the staff here at *CW* have been busy cooking up another hot issue. This time, however, we've had some extra help. We're pleased to welcome Jenifer Esile to our staff, and we're certain that with this new addition, we'll be able to the improve the quality of *Commodore World* while meeting the rigorous schedule that keeps your issues showing up at regular pace.

As most of you are aware, we've been placing all new subscribers and re subscribers into our Subscription Sweepstakes. Sadly, all good things must come to an end, and the drawing is now closed. The good news, however, is that thirty-two of our lucky subscribers will find their subscription number tucked away in the pages of this issue. Since our database guru has randomly generated only the subscriber numbers directly from our database, even we didn't know the names of the winners until looking them up after they were drawn.

So, how can you find out if you're one of the lucky winners? Take a peek at the winner's circle found within the pages of this issue and... HEY! HOLD ON! The least you could do is finish reading the rest of my editorial before you go ripping through the pages looking for those numbers!



DEAD COMPUTERS

In a recent phone conversation with Jeff Jones of *Loadstar*, I was saddened to hear that many of the users who opted not to renew their *Loadstar* subscription cited that they did not do so because their computer no longer worked, and they didn't know where to get it repaired. It's understandable that we lose numbers to other platforms for various reasons, but there are several reputable mail-order repair facilities left, and no doubt even more local ones we don't know about. You will probably hear more about this from Jeff Jones himself, but I think we should all help him in collecting and disseminating information on any and all repair facilities left. To that end, if you know of any companies that repair Commodore Computers, jot down the name, address, and phone number, and send the information to Jeff at *Loadstar*. If you don't have *Loadstar*'s address, send the info to my attention here at *Commodore World*, and I'll be happy to pass it along to Jeff.

Doug Cotton
Editor

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BACKTALK

LETTERS AND QUESTIONS FROM OUR READERS

Sequential File Copies

I use a C128 and my main use of disk drives are two 1581's with two 1571 drives that I can switch in and out as required. Most of the programs I use, other than word processors, I write myself in BASIC, and if needed for speed I compile them.

Recently, my friend and I created 293 RECIPE sequential files and saved them to a 1581 disk. The first program on the disk is a BASIC program file that will list the names of the Recipe file names to the screen for selection to view and print to a printer. The second program on the disk is another basic program that will access all of the seq files on the disk, get their title and print on my printer a cross reference list of the file names as related to the title of the recipe. It will also scratch and save the list back to disk as a sequential file for access, which is the third file on the disk.

I recently wanted to copy a few of these files to another disk, selected at random. So, I dug out my collection of file copiers and began. First, I tried DOS SHELL but learned that does not work on 1581 drives. Next, I tried FAST HACK'EM and found it will list for selection the first 70 files only! Even then, the program had trouble making file copies.

So, I grabbed my SUPER 81 UTILITIES disk by Free Spirit Software, Inc. I booted the disk and selected FILE COPY from the main menu and proceeded to copy the files. The program loaded the file names from the source disk, but I found it would load only 160 seq file names, no more! The manual for SUPER 81 UTILITIES said that 50 files at a time could be selected for copy. No way! I could only select 14 files for copying and when I tried to copy those, my computer immediately locked up and I had to re-boot the program.

Finally, after many tries, I was able to copy as many as 8 seq files in one pass. Then I was returned to the main menu and had to re-insert the program disk to again select the FILE COPY utility. Bummer! There are many other problems that I have discovered while using SUPER 81 UTILITIES, but that's a different story.

Now I was getting desperate. I should have copied the whole disk and then deleted the programs that I did not want. But hey, that's not the way it should work. I then tried UNI-COPY which came on the DEMO/UTILITIES disk supplied with my purchase of my two 1581 disk drives. I ran the BASIC program and found that is will only load 232 field names for copy selection. I tried changing the DIM statements in the program but to no avail. UNI-COPY program had an ML portion attached to the end of it which is not visible when you list it. It will also not run if you attempt changing it, since it is RAM memory sensitive.

Then I tried FILECOPY from the same Commodore disk, and found that I had to increase the values in the DIM statement DIM N$(200),T$(200),CE(200) to (297) before all field could be accessed on my Recipe disk. The program is a bit slow in loading the field names, but it can be modified to use and ML filename loader routine for increased speed. This I have done, and the program runs just great! The reason I was able to modify FILECOPY, is because it is written in BASIC and BLOAD's an ML program from the disk into the RS-232 input buffer (C128). This means that it is not sensitive to RAM memory as UNI-COPY is.

You see, I don't know ML and I don't know Assembly Language programming, but I now have a decent 1581 SEQ FILE copy program; one that will copy 296 files in one pass! The point being, many BASIC programs that are Freeware or Shareware are much better than that of "store-bought" ML mint. Fred Bowan, you have written some pretty good programs! Thanks.

- Larry Pankey

As you've indicated, there seem to be a lot of pitfalls to the array of copiers out there. CMD found this out as well when we first created our HD Series hard drives for the C64 and 128. Initially, we shipped UNI-COPY with these drives, but we knew that this could only work as a stop-gap until something better could be done.

Eventually, we created FCOPY (and later, FCOPY+), our own file-copier for the C64/128. While FCOPY lacks some of the speed attributes of other commercial copiers, it does well enough on JiffyDOS equipped drives. The benefit is that using stock methods of drive access made the copier compatible with a much wider range of devices than most commercial copiers. Furthermore, FCOPY can handle all file types, including REL files.

And because FCOPY was initially designed for users of our hard drives, we used a 'dynamic' table to store filenames to be copied. The initial version allowed up to 1500 files to be selected for copying. This has been reduced slightly in newer versions due to the addition of other options, but is still well into the hundreds. FCOPY+ is available as part of CMD UTILITIES from CMD.

Another solution to copying a lot of files is built right into Jiffy DOS (for users who have it). Since that copier uses the "BASIC" director listing for marking files, you can copy as many files as a loaded directory will allow you to have. Again, it isn't as fast as some commercial copiers, but it's a lot better than some of the "shareware" types.

Commodore World reserves the right to edit letters published in this column for length, spelling, and clarity. If you have questions or comments, write to: *CW Backtalk, c/o Creative Micro Designs, Inc., P.O. Box 646, East Longmeadow MA 01028.*

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The Amiga Technologies Weather Forecast

Tracking the Storm of the Commodore 64 and Amiga

by Jason Compton, Editor of Amiga Report

The weather forecast from Bensheim, Germany, home of the newly formed AmigaTechnologies, goes something like this these days: Mostly cloudy with occasional news showers.

The Commodore assets were acquired in late-April by Escom AG. At first, Escom and their spin-off Amiga Technologies flooded the wires with press releases and promises for the renewed production of the Commodore 64 and Amiga lines of computers. But the 64 remains a sleeping beast and newly manufactured Amigas have not made it to the starting gate yet.

The weather looks something like this: On May 30th, Amiga Technologies and Escom held a press conference in Frankfurt, Germany. With roughly a dozen speakers on the docket, it was a chance to lay a foundation for the new company and share its initiatives. Virtually all of the speakers exclusively addressed the Amiga, commenting on their involvement with its past and looking ahead to its future. They laid out bold marketing strategies and unveiled immediate improvements for the line, including a potential processor upgrade for the low-cost A1200. Escom brass announced plans for strategic alliances with multimedia industry leaders, with a top Scala executive on hand to back them up as living proof.

Then the wires went dead. When pressed for more information, new developments, more licensing news, solid policy decisions, Amiga Technologies only asked for patience and understanding as they tried to get their company up and running. It was Dan Stets of the *Philadelphia Inquirer*, not Amiga Technologies, that had the next news to offer. It seemed that the initial plans to have manufacture of the Amiga and 64 done in China had fallen through, and Amigas would now be produced in Scotland and Philadelphia. The explanation for the change was the inability of Tianjin Family-Issued Multimedia Corp, the contracted Chinese manufacturer, to retool its facilities in an acceptable length of time for the projected fall '95 reintroduction.

Soon after, the rain started falling again. Creative Equipment International, the Amiga distributor whose bid for the Commodore assets fell short of the goal, announced that it had struck a deal with Amiga Technologies through their North American representative, Ed Goff. Goff, a former Commodore vice-president and legal counsel, provided CEI with an initial product line and street prices: $3,500 for an Amiga 4000T with 6 megs of RAM, 540 megs of hard drive space, and a Motorola 68040 processor at 25 megahertz. While the 4000T was only sold in limited quantities by Commodore before its demise, it clearly represented a price increase for an unchanged machine. Combined with the unavailability of the lower-priced Amiga 1200 in North America for the rest of the year and an equally jolting increase in price for the CD32, the Amiga CD-ROM console, the situation was collapsing fast.

An uproar ensued. Amiga users called, faxed, wrote, and bellowed. Goff explained the price as a necessary consequence of high production costs. Still, the flames grew. Finally, in response, Gilles Bourdin, press officer for Amiga Technologies, issued a release flatly denying that the price was an official company decision. In fact, the release went on to deny that no "firm" North American distribution channels had been established. Petro Tyschtschenko, general manager of the company, flew out to Philadelphia for an impromptu North American distribution meeting. As this issue goes to press, the full results are hazy, but a price significantly lower than the proposed $3,500, though still higher than the industry average for a home computer, seems to have come out of the wash.

While the 64 was not on the minds of the participants of that meeting, it has not been forgotten. When I contacted Ed Goff, who doubles as legal advisor to Amiga Technologies, we discussed the future of the machine. The line at the moment is that neither Escom nor Amiga Technologies will directly pursue the manufacture of the machine. However, they have already been approached for licensing terms by CD-ROM manufacturers interested in compiling emulation collections. Apparently, no company has expressed interest in a total-package license of either the 64 or the entire line of Commodore 8-bits with the intent to manufacture, but Goff did not rule such a deal out, and CMD was quite receptive when I offered Goff's number and suggested a chat.

The advantages of such a license for Amiga Technologies are clear. Virtually money for nothing, the only cost to the company would be that of locating the necessary documentation, dyes, and molds and boxing them for shipment. The advantages to the market are just as evident, returning fresh product to the market and allowing for future development and perfection. The C-65 may be the Holy Grail of collectors and tinkerers now, but as a completed machine, it would be formidable.

Along with the shower of news that brought the Great $3,500 Price Fallout came news of an Amiga Technologies "miniature developer conference" and the first public appearance of the company at a trade show. On July 7, Amiga Tech invited the leading German developers of Amiga hardware and software to a meeting and "brainstorming session" held by Manfred Schmitt, president, chairman, and majority owner of Escom AG, and Tyschtschenko. The primary goals, beside allowing Escom's top man to pick the brains of some of the Amiga's leading developers, were to discuss continuing development for the existing Amiga lines as well as to exchange ideas on the future enhancement and growth of the technology. A similar meeting is forthcoming in London, England.

From August 26th until September 3, Escom AG and its subsidiaries Virtual Products and Amiga Technologies will be at the "Internationale Funkausstellung" computer fair in Berlin, Germany. Amiga Tech plans to display the Amiga 1200 and 4000T lines of computers while Escom will unveil its Commodore Golf PC line of computers, Pentium-class machines intended to capture more of the German market with the name recognition of the once-mighty computer company.

The Amiga and the 64, the sleeping beauty sisters of computing. The door is open to suitors for the older daughter, may she marry well. As for the younger, her second stepfather says he's ready to make a worldly woman of her. (Remember, Commodore bought the Amiga from Amiga Corp.) Can Amiga Technologies end the story happily ever after for these two? Watch this space.

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COMMODORE TRIVIA

by Jim Brain

Welcome to another edition of Commodore Trivia. As many of you may know, these trivia questions and answers have been donated by me to the Commodore community at large. Unlike other articles in Commodore World, these trivia questions have been placed in the public domain. I ask only that the trivia questions remain intact and unchanged, and that my name and address appear somewhere so users can contact me. The trivia is also used for a contest I run on the Internet; contact me at the included address for more information. Because curiosity has the best of me, I always welcome a note or postcard detailing where the trivia goes. I always welcome new questions—provided they come with answers. Enjoy.

Jim Brain
Brain Innovations, Inc.
602 North Lemen
Fenton, MI 48430

COMMODORE TRIVIA #8 QUESTIONS

$070 On a PET series computer, what visual power-on indication will tell the user whether the computer has Revision 2 or Revision 3 ROMs?

$071 The IEEE-488 interface is sometimes called the GPIB interface. What does GPIB stand for?

$072 Commodore manufactured at least two hard drives with IEEE-488 interfaces. Can you name them?

$073 Why didn't buyers like the original PET-64?

$074 On a PET Revision 2 ROM, what was the largest single array size that BASIC could handle?

$075 On the stock 1541, data is transmitted one bit at a time. How many bits are transferred at a time on the Commodore 1551 disk drive?

$076 On all Commodore floppy disk drives, how fast does the disk spin?

$077 Upon first reading the Commodore 1541 Error channel after turning on the disk drive, what error number and text is returned?

$078 What error number and text is returned on a 1551?

$079 Commodore printers are normally assigned to device #4, but they can be also used as device #?

$07A What microprocessor is used in the Commodore 1551 disk drive?

$07B When the VIC-20 was designed, the serial port throughput was roughly equivalent to the throughput of the IEEE-488 bus? Why isn't it very fast in production VICs?

$07C On Commodore computers, how much RAM is set aside as a tape buffer?

$07D On Commodore computers, most every peripheral has a device number. What is the device number of the screen?

$07E What is the device number of the keyboard?

$07F Commodore computers use 2's-complement notation to represent integers. What is the 2's-complement hex representation of the signle byte -1?

COMMODORE TRIVIA #7 ANSWERS

$060 According to the initial power-up indication on the monitor, a stock Commodore 16 has 12277 bytes free for BASIC program use. A number of people have calculated 12287 bytes, so the power-on message may be in error. I guess it is time to dig out the C-16 and power it up.

$061 According to its initial power-up message, the Plus/4 has 60671 bytes free.

$062 "The Friendly Computer"

$063 Though not well-known outside of the US, Henry Morgan introduced the new Commodore 64 computer system in the US. In other countries, the answers differ, as countries like Finland had the Statue of Liberty announce the C64 birth.

$064 TEDMon. TED, as you know, stood for Text Editing Device.

$065 21.

$066 The interpreter program is called the Interface Processor (IP). It handles the dispatching of all commands sent to the drive, as well as corrdinating the flow of traffic between the disk and the computer.

$067 First, we need to define hard-reset. A reset differs from a power-cycle, since the latter does not retain the RAM contents. In this case, the answer is analogous to the RUN/STOP-RESTORE combination found on the 64 and VIC-20. Hold down RUN/STOP and CTRL and press the recessed reset button on the side of the computer. I believe this works for the C-16 as well.

$068 Rumor has it that Jack Tramiel always wante to use a naughtical term, but most had been already used. However, one day he watched a moving company van pass by on the street with the name he decided to use as soon as he saw it: Commodore.

$069 He went to Apple Computer. He stayed with them briefly, but it seems that Apple and Chuck got along even worse than Commodore and Chuck.

$06A First, he went off to start a company called Sirius, which died almost before it started due to a lawsuit over the name. Then, he and some former Commodore designers came up with the "Victor" computer, which did modestly, but never took off.

$06B The KERNAL routine at $FFD2 on all Commodore 8 bit machines outputs the PETSCII character code contained in the .A register to the current output device. The carry flag indicates the presence of an error on return.

$06C The 1581 has a couple such hidden messages. In the idle loop of the IP, the text says "am i lazy???...no just wanted to save a few ms...". Also, in the same loop, the following can be found: "this is lazy!!!". Lastly, the credits in the 1581 roms are: "Software david siracusa. hardware greg berliNZDedicatedto my wife lisA". (Note: the N in berliN and the A in lisA is typical of how strings are stored in the 1581, last byte has bit 7 set. The Z after berliN appears to have been a typo, but I can't say for sure. I have a program that displays these. (Email me for info.)
The 1571 has the ROM authors' names hidden at the beginning of the ROM, but I don't have a 1571 to scan for them.

$06D The PET 2001. Some said the 128 has a hidden message, but it wasn't the first.

$06E By typing: wait 6502,x (where x was a number between 1 and 255) the computer printed Microsoft! x times on the screen.

$06F Truthfully, NTSC can stand for different things. In regards to the television standard for the US, the expansion is National Television Standard Code. However, the body that formed the standard is also called NTSC: National Television System Committee.

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ON THE HORIZON

COMMODORE AND COMPUTER INDUSTRY NEWS

GEOS Users Get Faxed

After several months of delays, Click Here Software has finally put the finishing touches on their initial release version of geoFAX. While the program was initially slated for release early this year, CHS programmer Maurice Randall explained that a number of unexpected problems arose while developing the software, including having to overcome a flaw in the fax protocol routines built into most current fax modems. This latter "bug" created serious problems in coding the program, since overcoming its undesired effects required optimizing the program for more speed.

With the problems overcome, however, CHS has become the first company to provide software capable of sending and receiving fax documents using a Commodore 64 or 128 equipped with a fax modem. The program is also the first GEOS application to make use of Creative Micro Designs' SwiftLink RS-232 interface, which is required for operation of the new software which works with high-speed fax modems.

Not all fax modems are created equal, however, warns CHS. This initial version of geoFax is only compatible with fax modems that provide built-in Group III, Class 2 fax protocols. Some fax modems lack Class 2 compatibility, having only Class 1, Class 2.0, or some combination of these. CHS further states that you can easily test your modem for compatibility by using a terminal program to send the following command to your modem:

AT+FCLASS=?

A modem that supports both Class 1 & 2 would generate the response:

1,2

If the response contains a 2 (not to be confused with 2.0), then your modem is compatible. (Some modems may support both Class 2 and 2.0, so you might see both.)

In addition to a SwiftLink and high-speed fax modem, other requirements for the first release of geoFAX include: a Commodore 64 or 128 with a color or monochrome 40 column monitor, GEOS 64 or 128 V2.0, and any GEOS-compatible disk drive combination. Since fax documents are rather large, and speed is of importance, CHS recommends RAM expansion and/or large capacity drives. The system will work, however, on a system equipped with only a single 1541.

CHS further recommends a high-resolution 8-,9-, or 24-pin printer, HP LaserJet, DeskJet, or PostScript laser printer is needed for printing out your faxes. Older 60 dpi printers (mostly Commodore or Commodore-compatible models fall into this category) are not directly supported by geoFAX, although they can be used to print out faxes that have been converted to geoPaint format.

An interesting side benefit of geoFAX's ability to convert incoming faxes to geoPaint documents is that it could become, in effect, a full-page scanning utility. Just send yourself a fax of any document you want to import into your computer, and convert it. This could be done from a remote fax, or right at home by using two phone lines and a regular fax machine. Furthermore, some of the newer fax machines can connect directly to the modem (they don't require the use of a phone company line), relieving you of the need for a second phone line. Some models also support halftone scanning, which makes them an even better scanning accessory.

GeoFAX is available directly from the author ($39.95 plus $4.00 s/h): Maurice Randall, P.O. Box 606, Charlotte, MI 48813, (517) 543-5202. It can also be purchased from dealers, such as CMD ($39.95 + $6.00 s/h). CMD [(800) 638-3263] has also announced special pricing on various combinations of geoFAX with SwiftLink interfaces and Boca fax modems.

Threshold Releases New Games

Two new game titles for the Commodore 64 reached our offices recently. Both come from Threshold Productions, which announced several months ago that they would begin work on several new games for the C64.

The first two releases include Slaterman ($14.95), a Mario-type arcade game, and Lazer Dual ($14.95), which is Tank-like arcade game with some interesting twists. Both titles

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can be purchased directly from Threshold via check or money order. No specific mention was made of shipping charges in the information we received, so you may want to contact Threshold for further details. Other dealers may also have these titles in stock soon. Full reviews of these titles will appear in upcoming issues of CW.

In addition to the two current releases, TP indicated that they have signed agreements with a number of other game developers throughout the world in an effort to bring more game titles to the U.S. market. The list of developers includes Cherry Software (Sweden); Timsoft, Vermes, Marex and LK Avalon (Poland); Substance (Germany); and Thunders (Hungary).

The list of upcoming releases was even more impressive: Crimson Twilight I: Seeking the Spirit Staff, Zytron Mega Blast, MegaThrusterBall, Triss, World Conquest, Blaster Twins, Arcade Pilot, Mean Cars, The Farm, Coldarius, Speed or Die, Zone of Darkness, Lazarus, Eternal, Drip, Lingos, Memomania, Colormania, Another World, Kacper, Keplomania, Gangster, Ghost Town, Time Traveller, King, Army Days, Droid, Bound, Zamczysko, Cosmic Hero, Madrax, Nocturno, Tamer, Robbo, The Curse, Spitter, Rulers of the Darkness, Castle, Arctic Hunt, Hans Kloss, Agent UOP, Acid Runner, Flummi's World, and The Evil Prince.

In addition to this long list of games, TP also included a sample copy of Driven (Issue #8) with their shipment to us. Driven is a disk-based magazine that covers the Commdore Demo scene. Subscriptions are $2.00 per issue (maximum of 3 issues ordered in advance). Driven is published approximately every other month, and subscriptions include the magazine, plus the newest NTSC demos, NTSC fixed PAL demos, utilities, and previews of upcoming games from around the world.

Threshold Productions, 17730 15th Ave NE, Suite 229, Seattle, WA 98155.

And More New Games From EBES

Two more games from Electric Boys Entertainment Software have made their way to the U.S. market.

Sword of Honour is a martial arts game somewhat reminiscent of The Last Ninja series. It features lethal weapons, hand to hand combat, music and over 2.5 Megabytes of compressed graphics which provide for over 90 colors onscreen.

Walkers is an arcade game similar in some respects to Lemmings—a little less complex, though the graphics quality is decidedly better than the C64 version of the aforementioned Psygnosis classic.

Both titles will be distributed in the U.S. by CMD, but no actual release dates or prices have been announced yet. Watch upcoming issues for further information and reviews.

All Future Modems to be Boca-Compatible?

Boca Research is proceeding in its plan to acquire Hayes Microcomputer, paying off all of the troubled company's creditors as well as all bankruptcy court claims. The Hayes name has always been associated with the highest quality modems, and most every modem manufacturer over the past few years has sought acceptance for their own modems by labeling them as "Hayes-compatible".

Boca has announced that they will adopt the Hayes name for their company upon completion of the buyout, but that the corporation will be headquartered in Boca's current facilities in Boca Raton, Florida.

Removable Media Drive Market Heating Up

Hot on the heels of Iomega's inexpensive Zip drive (100 MB), Syquest recently announced their own low-cost removable, a 105 MB drive priced at the same $200.00 price point. Not to be outdone, Iomega has gone after the high-capacity removable market with another low-cost solution: a 1 GB (yes, that's a Gigabyte) drive which Iomega calls the Jaz drive. Slated to sell for around $600, and with cartridge pricing at around $100 each in quantity, the new drive is bound to find wide acceptance among users with high-capacity backup and storage demands. In contrast, Syquest's 270 MB drives cost around $500, with cartridges going for approximately $60. The Jaz drive will also be capable of using less expensive 540 MB cartridges ($69).

Unlike the Zip drive, which uses a flexible magnetic meium encsed in a floppy-sized enclosure, and also unlike Iomega's other removable drives which use their proprietary Bernoulli technology, the Jaz uses standard 3.5-inch Winchester hard-disk technology enclosed in a cartridge, similar to products from their main competitor, Syquest.

ERROR CORRECTIONS

Issue 9 contained an error regarding our book review of *RAM DOS 128 Case Study*.

Brett Tabke of PHD Software, and author of the book, has informed us that Parsec is no longer the distributor of the book. It is now named *RAMDOS Internals*. Users wishing to purchase the book should write to:

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TOP TIPS

AUTOMATE THE JIFFYDOS FILE-COPIER

In response to a letter to the editor, and in honor of the celebration of JiffyDOS's 10th Anniversary, this installment of Top Tips provides users with a "BASIC SHELL" which helps to automate the JiffyDOS file-copier.

While the program itself is pretty straight-forward, there are a couple of features that might confuse users who do not own any of CMD's high-capacity storage devices. Such users can simply press the RETURN key when asked for partition and path information. Likewise, CMD device owners can either make use of these features, or accept the device's current partition and path settings by pressing RETURN.

The program prompts you with each file it finds. Press 'Y' to add the file to the copy list, 'N' to skip that file, 'B' to begin copying, or 'Q' to abort the copy. IMPORTANT NOTE: *Lines 32 and 34 are too long to enter on a 64 (or 128 in 64 mode); use shortcuts or skip the REM's at the end of these lines.*

JCOPY

```
F224  1 PRINT"{CLEAR/HOME}JCOPY - COPYRIGHT 19
      95 CMD"
ØEB3  2 TE=5ØØ:DIMN$(TE),T$(TE):FORI=1TOTE:N$(
      TE)="":T$(TE)="":NEXT
25Ø1  3 :
E31C  4 DV$="":INPUT"{HOME}{2 CRSR DN}SOURCE D
      EVICE{3 SPACES}";DV$:IFDV$=""THEN1
883E  5 DV=VAL(DV$):IFDV<8ORDV>3ØTHEN1
35FD  6 SP$="":INPUT"SOURCE PARTITION";SP$:IFS
      P$=""ORSP$="Ø"THEN9
78EC  7 SP=VAL(SP$):IFSP<1ORSP>254THEN1
41C6  8 OPEN15,DV,15:PRINT#15,"CP"+SP$:CLOSE15
58B6  9 PS$="":INPUT"SOURCE PATH{5 SPACES}";PS
      $:IFPS$=""THEN12
85A4  1Ø OPEN15,DV,15:PRINT#15,"CD"+PS$:CLOSE1
      5
25Ø1  11 :
FBAA  12 TD$="":INPUT"{CRSR DN}TARGET DEVICE{3
       SPACES}";TD$:IFTD$=""THEN1
53BA  13 TD=VAL(TD$):IFTD<8ORTD>3ØORTD=DVTHEN1
23CØ  14 TP$="":INPUT"TARGET PARTITION";TP$:IF
      TP$=""ORTP$="Ø"THEN17
ØD93  15 TP=VAL(TP$):IFTP<1ORTP>254THEN1
62E8  16 OPEN15,TD,15:PRINT#15,"CP"+TP$:CLOSE1
      5
EBD9  17 PT$="":INPUT"TARGET PATH{5 SPACES}";P
      T$:IFPT$=""THEN2Ø
9C2C  18 OPEN15,TD,15:PRINT#15,"CD"+PT$:CLOSE1
      5
6662  19 :
D9B4  2Ø PA$="":INPUT"{CRSR DN}PATTERN{9 SPACE
      S}";PA$:IFPA$=""THENPA$="*"
AA83  21 PRINT
8D92  22 :
F9CØ  23 OPEN8,DV,Ø,"$:"+PA$:FL=Ø:TB=Ø:NF=Ø
6B5B  24 GET#8,A$
C8BE  25 GET#8,B$:REM TOSS LINK
6B5B  26 GET#8,A$
F475  27 GET#8,B$:REM TOSS LINK2
1AEØ  28 GET#8,L$,H$:L=ASC(L$+CHR$(Ø)):H=ASC(H
      $+CHR$(Ø)):IFFL=ØTHENFL=1:GOTO45
A2FA  29 SZ=L+H*256:CT=Ø
67ØB  3Ø GET#8,A$:A=ASC(A$+CHR$(Ø)):IFST=64THE
      NGOTO52
24Ø2  31 IFA<>34THENGOTO3Ø:REM WAIT FOR QUOTE
A59Ø  32 GET#8,A$:A=ASC(A$+CHR$(Ø)):IFA<>34THE
      NN$(NF+1)=N$(NF+1)+CHR$(A):GOTO32:REM BU
      ILD NAME
8ØFF  33 GET#8,A$:A=ASC(A$+CHR$(Ø)):IFA=32THEN
      GOTO33:REM SKIP SPACES
25FC  34 T$(NF+1)=T$(NF+1)+CHR$(A):CT=CT+1:IFC
      T<3THENGET#8,A$:A=ASC(A$+CHR$(Ø)):GOTO34
```

JCOPY *(cont.)*

```
      :REM FILETYPE
25Ø1  35 :
692Ø  36 IFLEFT$(T$(NF+1),1)="D"THENK$="N":GOT
      O41
6315  37 PRINT"COPY ";LEFT$(N$(NF+1)+",",+T$(NF
      +1)+"{2Ø SPACES}",2Ø):" Y/N/B/Q? ";
88FD  38 GETK$:IFK$<>"Y"ANDK$<>"N"ANDK$<>"B"AN
      DK$<>"Q"THEN38
297D  39 PRINTK$
ØCCØ  4Ø IFK$="Y"THENNF=NF+1:TB=TB+SZ
4C83  41 IFK$="N"THENN$(NF+1)="":T$(NF+1)=""
DC3F  42 IFK$="B"THENCLOSE8:GOTO52
AAC1  43 IFK$="Q"THENCLOSE8:PRINT"{CRSR DN}ABO
      RTED!":END
CEF1  44 :
Ø3E4  45 GET#8,A$:A=ASC(A$+CHR$(Ø)):IFA=ØTHENG
      OTO47:REM Ø AT END OF EACH ENTRY
3315  46 GOTO45
3D24  47 GET#8,A$:A=ASC(A$+CHR$(Ø)):IFA=ØTHENG
      OTO49:REM 2ND Ø AT END OF BLOCK
728D  48 GOTO27
DA5E  49 GET#8,A$:A=ASC(A$+CHR$(Ø)):IFA=ØTHENG
      OTO52:REM 3RD Ø AT END OF DIR
728D  5Ø GOTO25
6662  51 :
2F55  52 IFNF=ØTHENPRINT"{CRSR DN}NO FILES SEL
      ECTED!":END
EBEC  53 PRINT"{CRSR DN}COPYING"NF"FILES USING
      "TB"BLOCKS":CLOSE8
8D92  54 :
1CCC  55 @#DV:REM SET SOURCE
15B2  56 @XTD:REM SET TARGET
6662  57 :
B8EE  58 FORI=1TONF
A56F  59 F$=N$(I)
DB52  6Ø PRINT" COPYING: ";F$
58C3  61 IFT$(I)="PRG"THENGOSUB69
8EE9  62 IFT$(I)="SEQ"THENGOSUB71
C2A8  63 IFT$(I)="USR"THENGOSUB73
29FC  64 IFT$(I)="REL"THENGOSUB75
2A9D  65 NEXT
ØF9C  66 :
2A9D  67 END
D35C  68 :
6414  69 *(F$)PRG
81E9  7Ø RETURN
FD17  71 *(F$)SEQ
5D29  72 RETURN
BEAA  73 *(F$)USR
5D29  74 RETURN
2586  75 *(F$)REL
81E9  76 RETURN
```


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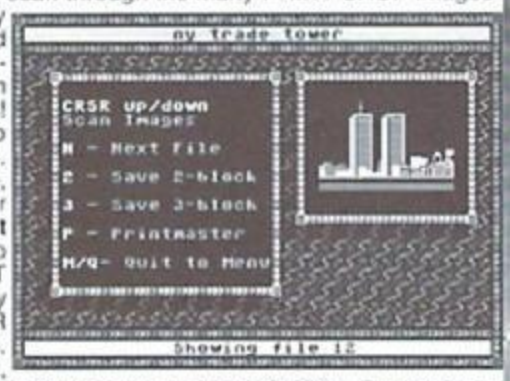

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Just For Starters

by Steve Vander Ark

COMMODORE BASICS FOR THE BEGINNER: PORT REVIEW & MORE SIMPLE BASIC

Over the last few issues of this magazine, I've spent quite a bit of time discussing programming in BASIC. There are a couple of reasons why I've done this (apart from the obvious fact that the editor asked me to). First of all, BASIC is the language you have to use to control your Commodore computer. All those commands you type in to do things like format disks or load and run a game are part of the Commodore's built-in BASIC. In order to become more proficient with those commands, then, it pays to learn more about how the language works. Second, programming is an important part of using a computer to a lot of users. This is particularly true, I think, of Commodore users. Let's face it, most people don't buy a high-powered Pentium or a Power PC Macintosh so they can program it. But the Commodore, well, that's different.

I think a third reason for writing so much about BASIC is that programming is very good for your soul. Oh, boy, I hear you say, Vander Ark has really gone mystic on us this time. But think about it. When you know how to program your computer, even something as simple as a few lines to control text on the screen, you gain a sense of power over the machine. I think that all new computer users face a feeling of helplessness at first. I see this when I work with people as a computer consultant, helping them to use those machines on their desks productively. New users are intimidated by computers. I know I was, and I'm one of those people who reads computer manuals for fun. But when you start to program, you start to realize that you are calling the shots. You can make the computer do exactly what you want it to do. Not only that, but you also start to realize that there is in fact a very specific, understandable logic to the whole thing. Maybe you don't know all the ins and outs of how your computer works, but you do know enough to convince you that you do have control. You have power over the machine.

Think about the program you use. Maybe you're a games aficionado. Maybe you do word processing or work with a spreadsheet. Consider that those games and productivity programs you use were written by people just like you who have just learned more of the same stuff you're starting to learn. At some point, they haltingly entered a few lines and made a computer somewhere print a simple "HELLO" on its screen. And those same people learned the same kinds of things you're learning now, step by step, until they were able to write programs that amaze others. For a lot of those people, their first programs were written in BASIC on a good old Commodore computer.

On The Edge

This issue we'll continue with our discussion of BASIC. Before I get into that, though, let's take a brief tour of the outside edges of your computer. Way back in the second issue we talked about hooking up various equipment to your computer and from that you should at least have a passing familiarity with some of what we'll be talking about here, but stick with me. I'll get a little more systematic about it in this column. Don't get scared off here, I'm not going to get all technical on you. I don't know much about the inner workings of this stuff myself. But there are a few details I can give you which just might come in handy. We'll be talking about switches and *ports*, which is the name for an opening where you can insert a plug or a device of some kind. Just to keep things simple for this time around, I'll stick with the arrangement on a 64. A 128 has all these same ports and switches in more or less the same places, with a few extras thrown in for good measure.

Let's start at a logical place: the on/off switch. By now, I am fairly certain you'll know where that is, but just to make sure we're all together, I'll officially tell you that it is on the right side of your Commodore toward the back. Next, notice that port right near the on/off switch. That's where you plug in the power cable. I know...you knew that already. There are two other ports on that side of the computer, both the same. Those are the joystick ports, and yes, you plug your joystick into them. They are numbered, by the way: the one nearer the front of the computer is number 1 and the other one is number 2. Most games use port 2 for some technical reason that I've never been too clear on. You also plug your mouse into a joystick port, as well as things like a Koala Pad graphics tablet or a lightpen.

The front and the left edges of your computer don't have any ports or switches, but the back has a whole bunch of them. Since we've been traveling around the outside of the machine in a clockwise direction, we'll encounter that wide port toward the left side first. That's a very useful port usually referred to as the "user port." You can use it to plug a modem into (probably the most common use for this port.) The VideoByte II and other digitizers also use this port. If you need an RS-232 interface, say for a printer or a non-Commodore

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modem, the user port is where you'll plug in the cable. Unfortunately, you need a specific Commodore RS-232 interface cable for this and they can be hard to come by these days.

There are other ports on the back as well. Right next to the user port is the place where you can plug in a Datasette. I know, no one uses a Datasette anymore (that's the name for Commodore's own cassette program recorder). But the port is still there, and every so often someone will come up with a use for it. I have a Xetec printer interface which has a little cable that plugs into the Datasette port, for instance. Next to that are two round ports. I always get them mixed up, so I double-checked before writing this. The first one is the "serial" port and it is here that you plug in your disk drive cable. You can attach other serial devices to your computer by connecting them to each other in a long line, starting with this port. Multiple disk drives are hooked up this way, as are some Commodore printers. The second round port is for your video cable if you are connecting your Commodore to a monitor. The next little round port is for a standard RCA jack, the kind you use for hooking up a stereo. If you're using your Commodore with a television set, you're plugging that cable into this port. When you plug your 64 into a television set, you need to specify which channel it will use (either 3 or 4; go for the one that isn't already used by a non-cable station in your area). You adjust this with that next little switch you see on the back of your machine.

Finally, we find the cartridge port. This is a very useful port indeed. It was originally designed to accommodate programs on cartridge, which was the way a lot of games came back when the Commodore 64 was first produced. Now you are more likely to be plugging a RAM device into it like the RAMLink. As you use your Commodore more and more, you may find that you have more than one device you'd like to keep plugged into this port. Creative Micro Designs sells expanders for both the cartridge port and the user port which will let you do this with ease.

Go with the flow

The more programming you do with BASIC, the more you need to think about something called "program flow." The program flow is the sequence in which things will happen in your program, which command will happen first, which will follow next, and so on. BASIC uses line numbers, so at first the flow of a program may seem obvious. In all the programs you've written so far, the flow has proceeded numerically from the smaller line number to the greater.

Of course, you don't need to write a program in exactly the same order that it will actually *execute* or happen when you type RUN. You can add a line to the sequence wherever you like simply by typing a line number that fits somewhere in between two other line numbers and typing in a BASIC command. When you finish typing and press RETURN, your new line will insert itself in the numerical sequence as nice as you please. When you run your program, however, each command will execute in exactly the order they come numerically by line numbers.

Until something tells BASIC to skip to another spot, that is. There are times when it's handy to be able to skip a few lines. Let's imagine a program which asks a question of the user. When they answer, the program might respond one way for a "yes" and another for a "no" response. That kind of thing would be impossible if the program was forced to plod along to the next command, no matter what. But fortunately, there are a number of commands that make it possible for the program flow to change in a number of interesting ways. For now, let's take a look at one of the most basic, GOTO.

GOTO means exactly what it looks like it means: "go to." When you use GOTO, you need to specify where exactly you'd like the program to go. This is done by placing a line number after the GOTO command. Try this:

```
10 PRINT "I LIKE TO"
20 PRINT "PROGRAM"
30 PRINT "IN BASIC ON"
40 PRINT "MY COMMODORE."
```

When you run this program, you'll see this sentence appear on your screen.

```
I LIKE TO
PROGRAM
IN BASIC ON
MY COMMODORE.
```

Now let's add a line between lines 20 and 30. On a clear line type

```
25 GOTO 40
```

and press RETURN. If you list your program you will now see that line 25 with its GOTO statement has been inserted. Now run the program. The sentence has changed, hasn't it?

```
I LIKE TO
PROGRAM
MY COMMODORE.
```

You'll notice that line 30 was never executed. The GOTO forced the program flow to skip ahead to line 40. This is a simple example of how the program flow can be interrupted by a command.

In order to create a program that reacts to a user's response to a question, though, we need to do more than just jump around. We need some way of telling the computer to look at what the user entered and then jump to one line or another depending on what it was.

This is actually quite easy to do. The command we'll use is IF, followed by the command THEN. What we'll be telling the computer to do is IF a certain thing happens THEN do something. That something at the end there can be any number of commands. We'll use a GOTO.

Here's how the whole thing will be set up. Read the notes to see what's going on in each line.

```
10 INPUT "DO YOU LIKE DOGS
(Y/N)";A$
```

This line will ask a question of the user and then take the answer and call it A$. That A$ is a variable; the dollar sign tells the computer that the information entered will be text, in this case a Y or an N.

```
20 IF A$="Y" THEN GOTO 50
```

Here's our IF and THEN line. Notice that we told the computer to compare the answer entered by the user to the letter Y. If there is a match, the THEN part of the line will execute and the program flow will jump to line 50. If there is no match, the program flow moves on to line 30 with the THEN part never happening.

```
30 IF A$="N" THEN END
```

Another IF...THEN statement, this time stopping the program with an END if the user doesn't like dogs. We can actually place any command we want there after the THEN.

```
50 PRINT "BOW-WOW!"
```

This is what will happen if the user enters a Y for yes.

We could still have a problem, though. What if the user enters something other than Y or N? How can we make our program more user friendly? The whole question of handling user input is a very important one. There are a number of excellent ways to streamline and safeguard the process. Next issue we'll talk about some of those things.

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Foreign Exchange

By Joseph Gaudl

EUROPEAN VACATION?

Recently, this front page title of an Austrian newspaper caught my attention: "GERMANS INVADE AUSTRIA!" We experience this "invasion" every summer. Hundreds of thousands of Germans—all going on vacation at the same time—head south into the Austrian Alps or use Austria as a stop over on their way to the Mediterranean beaches. Most main south bound autobahns resemble immense parking lots on the weekends. Almost all Europeans receive a three to five week PAID vacation and tend to splurge or "blow the wad" once they reach their destination.

You may be telling yourself that this has absolutely nothing to do with the Commodore 64/128 and that is exactly the point of this month's Foreign Exchange. As far as computing and programming are concerned, the market and programming activities are dead! From June to August there is very little movement in the computer scene. Sales drop off, as people are saving their cash for Apfelstrudel and Italian ice cream and programmers are more interested in bikes and bikinis than peeks and pokes! This is, then, a good time to talk about some interesting developments and items that occurred just before the summer invasion.

Most of you know already that Commodore was finally purchased by the German computer giant ESCOM. What you may not know, is that this is very good news for C64 users. ESCOM is a top notch company with branch offices and partners all over Austria and Germany. The fact that they will "definitely and irrevocably produce the C64" (quote) was once again confirmed at a press conference in Frankfurt in early June. Many

experts are predicting a C-64 renaissance here, should ESCOM re-import the computer and parts back into Germany at rock bottom prices. Now, try to picture the impact a US computer company of, let's say, the size and influence of CompUSA would have on the C64 if they had purchased Commodore and made this announcement. I dare say that a lot of software companies would get back into the 8 bit market in a hurry! I certainly do not want to wish the summer away, but I can't wait until ESCOM's summer vacation is over and their fall press releases start hitting the news wires.

With the birth of the CMD SCSI HD-Series, many of us have toyed with the idea of hooking up a CD-ROM drive to our computer. Although the hook up isn't very complicated, we have never had a real reason to do so. Until now, that is. Achim Täge from Wölfrath, Germany has given us a reason. His CD-Commander for the C64 and C128 went on sale here in May and is quite the program! After hooking up a SCSI CD-ROM drive to a CMD HD, his commander allows you to install the drive, determine drive numbers, send BASIC 2.0 commands and copy one or more files from the CD to your HD or another device. BASTA!—as the Italians love to say. ("That's all there is to it!" is a good translation.) Once copied, you can use Big Blue Reader to transfer the files into a usable Commodore format. The Commander works without a hitch here on the European Commodore 128's, and testing of the program has begun in the USA on the NSTC systems. Achim is also working on a CD-Audio program for the C64/128 and the beta version is currently being tested here.

64NET is a special management hard and software kit which hit the German market in April. The kit allows a Commodore user access to a PC, XT or AT hard drive where he can create 1541, 1571 and 1581 partitions. He can then use them as he would a normal floppy drive with all functions and memory characteristics. This is a unique way to get to play ball with the big boys, and because of the parallel connection disk access, speed is claimed to be comparable to that of CMD's HD-Series. We'll have more information on this kit in future issues of CW.

The last item on this month's agenda is a program that has been available in Europe for about a year now, but is just now coming into its own. Arndt Dettke and Wolfgang Kling have put years of programming into their GoDot, a masterful piece of graphical programming wizardry that is without a doubt in a class all by itself. Whether you are creating your own graphics or importing them from other computer formats (Amiga IFF, PCX, etc.), GoDot does it all. In order to do justice to the program and its authors, next issue's Foreign Exchange will be completely devoted to the introduction of this piece of software. In the meantime, I'm heading north for my vacation!

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Understanding Spreadsheets

by David Pankhurst

Have you ever wondered just what an Electronic Spreadsheet program is? Or more importantly, what one could do for you? Wonder no longer...

Although they are now well into their second decade of use, computer spreadsheets are still relatively unknown to Commodore users. Most everyone has a word processor, and some use databases, but spreadsheets aren't as common as you see in the IBM world. Maybe the original game image of the C64 inhibited developers, or spreadsheets seemed too math-oriented for the typical user. In any case, spreadsheets here have never seen the development and use other computer systems have, which is a shame. By making working with numbers as easy as a word processor works with words, a spreadsheet eases the effort we have to put into such chores as budgets, taxes, and accounting. Learning about them and their uses is important, both because they are useful tools for working with numbers and the opportunities they spell in the business world.

Offices everywhere use the Big Three: Word Processors, Databases, and Spreadsheets. So learning each is good business. And what you pick up now on a Commodore is helpful since spreadsheets are fundamentally the same on all computers, and learning one will make the others easier to understand. With these thoughts in mind, let's consider what spreadsheets are, and what makes them tick.

Electronic Spreadsheets

One way to visualize a spreadsheet is as a large sheet of graph paper stretching in all directions. Each square of that paper is big enough to write a number, or a piece of lettering like a title or label. Results, such as totals and averages, are also placed in squares. This is the format that spreadsheets have had for years in business, long before the computer. Originally, large amounts of paper, or blackboards, held all the figures and results. Changes meant using a big eraser, and a lot of time correcting. Then the computer came, and someone thought of making an electronic spreadsheet called VisiCalc. The rest, as they say, is history.

This ease of changing is what makes electronic versions of spreadsheets so popular. Like the comparison between a typewriter and a word processor; the results are the same, but corrections are vastly easier to perform with the word processor. In each case, the advantage is the ability to adjust

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things easily. One example would be a column of figures that might be multiplied by fifteen percent and then totalled. Change that to sixteen percent, and you have quite a chore on paper. But on the computer, often only the number in one place need be changed, from fifteen to sixteen. And to make it even easier, the program will redo all calculations and display the corrected results automatically. This saves not only editing effort, but calculation effort, as well as the possibility of mistakes.

Some Uses

Keping figures accurately updated and reducing the effort of changes are two of the electronic spreadsheet's greatest assets. Not that they don't have other advantages. Because they keep things nice and structured in columns and rows (just like graph paper), they are handy for lists and tables, such as telephone directories or address books. And unusual uses exist; one fellow even managed to write a book with it. In fact, any time information is best organized into columns and rows, a spreadsheet is advantageous. For instance, tables needed by word processors are more easily set up on a spreadsheet, and then imported into the word processor.

This column and row organization is very natural when working with numbers, as any math student can attest. But organizing numbers isn't all they do; they also manipulate them. Changing fifteen to sixteen percent involves calculations applied to a column of numbers, and a total made of the amounts. All these calculations are contained in formulas that form a part of the spreadsheet, much like formulas in BASIC programs. Depending on the program, spreadsheets can include ways to manipulate numbers that rival BASIC, and even surpass it, using functions and operations suited to working with data in the spreadsheet format.

Spreadsheet Cells

Formulas are familiar to BASIC users, but comparing them to spreadsheets causes a difficulty; where are the variables? Simply put, each location on the spreadsheet can be a variable. Looking at the graph paper analogy again, let's focus on each square, which we'll now refer to as a cell. Each cell can be blank, or be filled with an item of importance—text (such as labels or titles), numbers, or formulas.

These cells are organized into rows and columns, and are referred to by their position. Often, the columns are numbered, and the rows have letters rather than a number: A-Z for the first 26 rows, the 27th to 52nd from AA to AZ, the 53rd BA, and so on. Of course, this isn't standard on the Commodore machines, and rows may be numbered, while columns are lettered. In any case, at the junction of any given row and column is a specific cell, and it's identified by the row and column names. For example, the only cell in both Row G and column 23 is called G23; IA200 is in the 200th column, and row IA; and so on. And when referring to these cells, the letter part always comes before the number, so 200IA is a mistake, not a cell.

Formulas rely heavily on these cell names in their calculations, because the cells are the variables in spreadsheet math. Typically, a BASIC calculation might look like this

```
X=A+SQR(B)
```

Which would take the value in A, the square root of B, add them, and place the result in X. In a spreadsheet, variables are replaced by cell names, resulting in the equivalent spreadsheet formula (with slight variations between programs):

```
A12+@SQR(B15)
```

Now instead of A, the value comes from cell A12; and for B, cell B15 provides the value. But what about X, the result? This formula, like A12 and B15, is a cell; and the cell is where the result is placed. If you were to look at the display, the result, not the formula, would be visible in this cell. Cells with formulas in them have this schizophrenic personality for a reason; formulas are needed for calculations, but it's results that matter, and spreadsheets are designed for this. The formula is easily accessible to edit or delete, but we see the answer on the display screen.

Displaying and Displays

The display of the spreadsheet takes up most of the computer screen viewing area. Typically, several lines at top or bottom are used for other purposes, and the rest devoted to viewing the spreadsheet. Along the top and left side of this display screen are the row and column identifications, always letting you know what section of the spreadsheet you're looking at. This is important, since you can actually see only a small portion of the whole spreadsheet at any time. On the C64 screen, 100 individual cells might be visible, yet a spreadsheet containing thousands of cells is possible. To see the rest, the screen scrolls around via the cursor keys. As you move to the bottom of the screen, a new row scrolls into view. Likewise to moving up, to the left, or the right. Like a magnifying glass on a large sheet of paper, you have to move around to see the whole picture.

Besides this display window, there is also the input or command line, the communication link to the spreadsheet. You can't directly contact any cell on the screen. Instead, a cursor is moved around the display, selecting individual cells. The contents of that cell is placed on the input line to be edited or deleted. Pressing RETURN then copies this data into the cell, where it's calculated (if a formula) and displayed.

The display of a cell's contents is formatted according to the type of data present. Text is chopped off at the right if it's too long to fit. And numbers are displayed according to a format which you can change. For instance, you might choose all numbers to display with three decimal places of precision. In this case, 1 would be shown as 1.000, and 2.4567 as 2.456—the display formats numbers to fit, even if they appear to lose value. Besides number formatting, cells are often adjustable as to whether the information is centred in the cell, placed against the right edge, or against the left edge. Colours are also optional on some spreadsheets displays. These display attributes all hold one thing in common; they do not affect the internal value of the number in the cell, only the displaying of it. 2.4567 is still 2.4567 inside the computer, as performing a calculation will show.

These display formats operate on selective parts of the spreadsheet. The whole spreadsheet can have a default, or global format. Additionally, specific columns or groups of cells may have their own format. One column for instance may be formatted for dollars (displaying two decimal places) while another column may be integers (displaying none). This variety allows you to make the spreadsheet 'look' more suitable for the type of information you're working with.

Functions in Spreadsheets

At this point you can probably imagine some jobs that would work well on a spreadsheet. Working with columns of figures would be as simple as entering them, one to a cell, and placing a formula at the bottom-most cell to total them. The result is immediately displayed in that cell. Errors and omissions are added or edited, and the results are reflected by all formulas.

Obviously, totalling columns isn't the only thing you'd like to do. Spreadsheets use a variety of functions to give their formulas usefulness. Many are similar to BASIC, such as finding the square root. But some are unique to spreadsheets. Column adding isn't easily possible in BASIC, but in a spreadsheet, a function like @SUM() (or something similar) would do the trick.

Using @SUM() as an example, you can see the effort it saves. Adding cells in a column from F6 to

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K6, without a function, would look like

```
F6+G6+H6+I6+J6+K6
```

and with it, it would be

```
@SUM(F6..K6)
```

Although the difference in typing is small here, imagine a larger column of one hundred entries—now the difference is clear.

The @SUM() function works on groups of cells, rather than one. This group can be a column (in this case), a group of columns and rows, or combinations of the two. Called blocks, these groups can be uniquely described by listing two cells, one from the top left corner, and one from the bottom right corner. This would mean that B5..D7 would outline a block containing the cells in rows B, C, and D, but only from columns five to seven. The function would use every number in this block (including results from formulas therein) in its calculation, and would be equivalent to:

```
B5+B6+B7+C5+C6+C7+D5+D6+D7
```

Spreadsheet Choices

All spreadsheets include a wide variety of functions. Some mimic BASIC, such as the @SQR() function. Others are unique to the business world, such as @PV() (for Present Value, a mortgage financial function). Still others have no real counterpart. Functions like @SUM(), @AVG(), and @MAX() find the sum, average and maximum, respectively, of a group of cells. Yet another useful function imitates a BASIC command, not a function—the IF statement. Like the BASIC command, this allows the selection of choices. Usually, the choice is between one formula or another, but it could be a cell or other calculation.

An example of the use of @IF() could be a price discount. If a customer spends over $1000 he gets a ten percent discount, otherwise a five percent one. A formula for this might look like the following:

```
@IF(A1<=1000,A1-0.10*A1,A1-0.05*A1)
```

The conditional test is the price range (A1<=1000). Commas separate the true and false choices. If A1 (the purchases) total more that 1000, the first choice is calculated (A1-0.010*A1), giving the ten percent deduction. If this test is untrue, the second choice is calculated (A1-0.05*A1), resulting in the five percent decrease. This function would return one of these two values, which could then be manipulated like the result from any other function.

Without the above @IF(), you would have to examine each customer, deciding which percentage he gets. Instead, you can create a formula and leave the checking to the spreadsheet, resulting in less editing and effort.

The formula could be further adjusted. If the limit for discounts changed monthly, the function could be changed to:

```
@IF(A1<=A9,A1-0.10*A1,A1-0.0 5*A1)
```

and place 1000 in cell A9. When this value changes, simply edit cell A9, instead of editing the more complicated formula.

Techniques like this to streamline formulas are important because of the way spreadsheets are set up and maintained. There can be many formulas, and adjusting them is an effort in a larger spreadsheet. So by removing the changing elements (the discount level) we remove the part likely to be edited. If the five and ten percent discounts were also likely to change, we could move them out of the function into their own cell. This serves to make all formulas for customers identical, except for the cell references each makes.

Streamlining Spreadsheets

Because of the repetitiveness present, spreadsheets allow for easy copying of cells. When a cell's formula is duplicated to another cell, the new formula's cell references are adjusted to reflect the new location. Keeping this in mind, often a spreadsheet can consist of one formula simply repeated throughout the spreadsheet, and adjusted for each location. This automatic adjustment saves the effort involved in creating large numbers of formulas for a large spreadsheet.

Automatically adjusting these cell names is fine in most cases, but not all. In the earlier example, the customer level at A9 would be adjusted when that formula is moved. Duplicating the formula down one row would alter the copy from

```
@IF(A1<=A9,A1-0.10*A1,A1-0.05*A1)
```

to

```
@IF(B1<=B9,B1-0.10*B1,B1-0.05*B1)
```

This would be fine if each customer has a personal limit, but what if A9 is to be the limit for all customers? In this case, we need to 'fix' the address of A9, so duplicating the formula does not automatically adjust these addresses. In spreadsheets such as 1-2-3, the way is to include the $ sign in each address to be fixed in place. With this in mind, duplicating

```
@IF(A1<=$A$9,A1-0.10*A1,A1-0.05*A1)
```

one row down would result in

```
@IF(B1<=$A$9,B1-0.10*B1,B1-0.05*B1)
```

with the cell reference to A9 unchanged. Now, if the limit changes, adjusting it for 100, 1000, or one million customers is simply a matter of editing one cell, A9.

A Small Example

To make this copying and formula writing more familiar, we'll work through a small example. A useful mortgage formula is @PV(), which means present value. Simply put, the present value is what a bank will lend you when you promise to pay a certain amount, at a certain interest rate, over a certain period of time. @PV() is a handy function for figuring loans and mortgages, and might be included as a function on your spreadsheet. We'll assume, however, that your spreadsheet doesn't have it, and build one from scratch.

Example 1

	1	2	3	4
A	Payment	Interest	# Payments	Present Value
B	$500.00	0.83%	360	$56,975.41

Example 2

	1	2	3	4
A	Payment	Interest	# Payments	Present Value
B	$500.00	0.83%	360	$56,975.41
C	$700.00	1.00%	180	$58,325.16

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In BASIC, an equivalent formula would be:

```
PV=PM*((1-(1+IN)^(-N)))/IN
```

The main components are the interest (IN), the number of payments (N), and the amount of each payment (PM). Note that the interest is per payment, not yearly. (For example, a loan paid monthly with a 12% annual interest rate would have a monthly rate of 1%). Changing this to a spreadsheet simply involves using cells for variables. Let cell B1 be the payment, cell B2 the interest, and B3 the number of payments. The formula, which we'll place in B4 (and where the result is displayed), would become

```
B1*((1-(1+B2)^(-B3)))/B2
```

Adding headings and appropriate formatting, the spreadsheet display would appear as shown in Example 1. (Notice the column and row labels, which would appear on screen).

As you change the values in cells B1-B3, the value in B4 would be recalculated and displayed, letting you rapidly try different options by varying the interest, payments, and length.

But what if you wanted to compare a variety of options simultaneously? Then you need two or more formulas, each with their own values. So you could copy the formula down one row, resulting in the formula:

```
C1*((1-(1+C2)^-C3))/C2
```

With the data placed in cells C1 to C3, the display should look something like Example 2.

What If?

Trying out options on a spreadsheet is nicknamed 'what-if' calculating, a term that only came into vogue when spreadsheets on computers made seeing 'what if I changed this' quick and easy. More than anything discussed here, this highlights what makes spreadsheets so versatile and useful. They help organize something we all usually need help on; numbers.

Your Number is Up

Whether they're used to manipulate, crunch, or just display numeric data, spreadsheets are a boon to people who detest math, as well as to those who don't. With a little time invested in learning to use spreadsheets, you'll soon find your own uses for them. And the first time you use one to handle a chore like accounting and taxes, you'll wonder how you ever did without it.

Commands in Spreadsheets: What Different Versions Can Do

The Commodore realm is a varied place for the spreadsheet user. Much of the problem stems from the early days of computing. When spreadsheets were first written, a single standard for calling up commands didn't exist. In the IBM world, Lotus 1-2-3 eventually made everyone toe the line, and spreadsheets there all work similarly. Alas, the C64 and C128 never met their 1-2-3 saviour, so everyone pretty much does what they want. The only thing you can be sure of is that your manual is your prime authority on what your particular spreadsheet does, and how it does it.

Commands are usually called up with a special keystroke or two, with keys like SHIFT, the function keys, and the Commodore key selecting variations. Depending on the program, you may have a menu of commands displayed, or nothing. This can make the difference between using a program intuitively via the menus, or pouring over your manual constantly.

Although the way to invoke commands differs widely, the actual operations performed do not. Most everything on the spreadsheet involves the display. Commands let you control the display look and feel, for instance, making columns of varying widths to fit more information on the screen. Numbers can be formatted for varying precision of decimal places displayed, such as two places for money amounts, or six for interest rates. Justification is another feature, letting each cell place its information centered, to the left, or to the right. Color is even used on a few programs, to highlight various cell values.

On some spreadsheets, rows and columns of cells can be fixed into place as titles. The viewing screen on the display is always just a small portion of the whole spreadsheet, so using the cursor keys scrolls different portions of the spreadsheet into view. On larger jobs, headings and titles are lost when scrolling unless you lock these titles into place. Similarly, windows can be opened up in which part of the sheet can be viewed at all times, no matter what part of the spreadsheet the rest of the display is showing.

Commands for editing data are among the most often used you'll encounter. Creating a spreadsheet of dozens of cells is much easier with cut, paste and copy operations. Also, since columns and rows are so significant, most include commands to add or delete rows and columns, handy if you've almost finished a spreadsheet only to realize you need another row in the middle.

Full I/O commands are included in most spreadsheets for the Commodores. Saving and loading files is the absolute minimum, but many spreadsheets also include commands for communicating with the disk drive, checking the error channel, listing directories, and sending commands. Printing to disk allows you to create files you can then import into your other programs or print at a later date.

Printing operations are provided by all spreadsheets, but here the available options vary enormously. Some can simply print out a section of the spreadsheet in a plain format. Others allow you to format your printed page, avoiding such problems as printing across the page perforation, or printing off the right edge of the paper. In some systems, codes can be sent to the printer, enabling such options as condensed printing, underlining, and other fonts. And one program even prints sideways (called landscape mode), letting you print out 11 by 8-1/2 inch spreadsheets, instead of 8-1/2 by 11.

A picture is worth a thousand words, or in the case of spreadsheets, a thousand numbers. Graphs make relationships stand out among data, and a few (but not many) programs include graphs. Although a common feature among the IBMers, it's a late innovation that may not have reached your program. With it, a block of data is formatted into a graph, which can then be separately displayed, printed, or saved.

It's a rare spreadsheet that has all these features. If you're looking for one, consider the features you need most when shopping. And if you already have one, review your manual, since there's often a way to perform a task with several commands in a row, if you can't perform it with a single command.

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Spreadsheets
By the Numbers

by Sherry Freedline

How do Swiftcalc, Calc II, Pocket Planner and geoCalc stack up against each other? Which program has the features you need to do what you want? Find out in this in-depth study of these four hard-working programs....

Recently, a message on a Commodore Bulletin Board (along with a gentle nudge from my editor) prompted me to investigate some of the spreadsheet programs still available for Commodore users. This search led to the discovery of four powerful programs: SwiftCalc, geoCalc, Calc II, and Pocket Planner 2. It also led me to the conclusion that selecting a spreadsheet program best suited your needs can be a very tough decision.

Let's tackle this great dilemma by first considering a few questions. To start with, survey your equipment and your computing likes and dislikes such as: operating environment, input devices (joystick, mouse, or keyboard), and your preference in regards to accessing features via key-combinations or menus. Some of these programs also have individual versions available for the Commodore 128. Due to the 128's extra memory and hardware, the 128 versions often contain added features like REU support, 80-column display, and pull-down menus. Next, contemplate the projects you'd like to produce with the program. Will you need to create graphs, and if so, what kinds? Which types of calculations will you need to perform—mathematical, statistical, financial, scientific, and/or trigonometric? Also, do you want to combine data from a word processor or database program into your spreadsheet? (This latter feature allows data from another program to be incorporated into a spreadsheet without retyping it, saving time.) And finally, how does the program handle hard copies of your spreadsheet? Can it print large spreadsheets sideways? Does it allow you to print grids, titles or alter margin settings? With these questions (hopefully) answered, let's review the programs and put an end to this great dilemma.

SwiftCalc

The first program on my list is SwiftCalc from Timeworks. Separate versions of SwiftCalc were produced for the Commodore 64 and 128, but the 128 version has now become difficult to find—even in the used market. The 64 version ships with a 90 page User's Manual and a keyboard template. The 128 version includes a 168 page spiral bound User's Guide and has no need for a keyboard template due to its easy to use pull-down menu system. All that's required to use SwiftCalc is a Commodore 64 or 128, a Commodore compatible 5 1/4" disk drive, and a Commodore compatible printer. The 128 version features an 80-column display, and thus it requires an 80-column monitor.

While the screen displays of the two versions differ, both contain a filename box, message box, input box, cell contents area, cell contents type indicator (for indicating whether the cell is blank, contains a label, numeric value, or formula), cursor location indicator, Auto-Calc status indicator, and of course the worksheet area. As mentioned previously, the 128 version also features a very easy to use pull-down menu system. In addition, the screen display colors in both versions can be easily changed to your liking.

Worksheets created in the 64 version can contain up to 104 columns and 250 rows of data (26,000 cells), while the 128 mode allows for 250 columns by 250 rows (62,500 cells) of data. SwiftCalc also provides a handy Auto-Calc option which you switch between automatic or manual calculation. (The automatic calculation feature automatically recalculates your spreadsheet data after every new entry). Auto-Calc can slow down the worksheet creation process considerably, so it's wise to turn it off until you've completed entering all the initial data into your worksheet. Once you've accomplished that, you can turn it back on to perform all the needed calculations.

Simple bar graphs based on your data can also be created in both versions. Numeric cells can be converted to bars of asterisks representing each cell's numeric value. SwiftCalc is such a powerful program that I was disappointed when I discovered that it didn't have more advanced graphing features (such as pie charts and line graphs).

Cell formatting options are vital to the appearance of your finished product. All spreadsheet programs allow the width of a cell to be adjusted to compensate for the cell's contents, and those contents can be justified to the left, right, or center. Numeric values can also include the following format options: commas, dollar signs, scientific notation, and up to nine decimal places. SwiftCalc lacks a data sorting option, but it does include a time-saving find and replace feature.

A spreadsheet would be little more than a word processing program without formula functions. SwiftCalc contains functions to solve most common mathematical, statistical, and financial problems. With the IF..THEN function, values may be included in your worksheet depending on the outcome of a specific condition. However, if you have a need for trigonometric, scientific, and

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in-depth financial formulas, SwiftCalc is definitely not the program for you.

Of course, no spreadsheet program would be complete without print options. With SwiftCalc, your spreadsheets may be printed directly from the program or through Sideways (a separate program solely devoted to the printing process). Printing options in SwiftCalc include centering, compressed type, single-sheet paper feed, page numbering, margin settings, number of copies, formula printing, normal ASCII output (for non-Commodore printers), and range or entire worksheet output.

If your spreadsheet uses a lot of columns, you'll definitely want to use the Sideways program. Sideways provides the ability to print your spreadsheets sideways. It also provides complete control over margins, and the spacing of lines and characters. Additional features let you to select a font and toggle double-strike mode. To do so, you must first create a Sideways file from within SwiftCalc. Be sure to save your spreadsheet to disk before creating this file, though, because once your file is in the Sideways format it can no longer be loaded into SwiftCalc. Of all the spreadsheet programs I've looked at, SwiftCalc provides the highest degree of control over printed output of your worksheet.

SwiftCalc is also an excellent program for the average spreadsheet user. The inclusion of the Sideways program creates an almost unbeatable combination. Unfortunately, due to SwiftCalc's limited graphing and formula functions, many users will be forced to look for a more powerful spreadsheet program. But keep in mind that SwiftCalc's Sideways program can be used with any spreadsheet program that can save its worksheets in ASCII format—a handy feature if you're not satisfied with the output from your current program.

Pocket Planner 2

Pocket Planner 2 is one of a trio of productivity programs developed by Digital Solutions, Inc. The other programs in this series are Pocket Filer and Pocket Writer (database and word processing programs, respectively). Pocket Planner is unique in that both the 64 and 128 versions are provided in one package—one on each side of the disk. The program can be used with a 1541, 1571 or compatible disk drives and a Commodore compatible printer. The 128 version of Pocket Planner 2 also supports using a joystick, mouse, and/or a Commodore (or compatible) RAM Expansion Unit (REU). Unlike most of the other programs covered in this article—whose manuals were written in tutorial style—Pocket Planner 2's manual is written more like a reference guide.

The construction of the screen display enables novice spreadsheet users to get up and running quickly. At the top of the screen is a six line display of options and how to access them. Most choices are selected by first pressing the Commodore Key and then pressing the first letter of the desired options such as L for Load. Once you've familiarized yourself with accessing Pocket Planner's commands, this help display can be turned off by pressing CONTROL H, allowing more room for the worksheet display.

The worksheet area is located directly below the help area. As in most spreadsheet programs, the screen colors can be easily adjusted. In both modes, 250 rows and 250 columns or 62,500 cells are waiting to be used in your spreadsheets. The only differences between the 64 and 128 displays are 80 columns in 128 mode, along with a tad more color. Otherwise, both versions look the same. Finally, Pocket Planner offers a window feature that allows different portions of a spreadsheet to be viewed on the screen at the same time. You can open as many windows as will fit on your screen, and that will depend on the size of each individual window.

One of Pocket Planner's shining features is its ability to use spreadsheets created with other programs. These include spreadsheets created in Microsoft's Multiplan, SwiftCalc, and in the 'Data Interchange Format' (DIF) available in VisiCalc, Multiplan, and possibly some others. As far as I know, neither VisiCalc nor Multiplan are still available, so it's nice to know that if your program disks from either of these programs were to get lost or damaged, your data could be recovered using Pocket Planner.

In my book, the ability to integrate with other productivity programs is a must, especially data from a database program. Pocket Planner 2 can load database files into a spreadsheet from Pocket Filer; it can also read data from most any other database program which stores or exports its data in sequential "text" files. Spreadsheets and graphs created with Pocket Planner can also be used in Pocket Writer documents.

As a PC guru for a local bank, I'd be lost without the ability to create graphs in various styles. With Pocket Planner 2 you aren't restricted to simple bar graphs. You can also produce line graphs and pie charts. And with the 128 version, you have the added option of creating X-Y and logarithmic graphs. And every one of these graphs can also be printed.

As far as cell formatting options are concerned, Pocket Planner lacks the ability to format cells with scientific notation. Other than that, it contains all the same formatting options as SwiftCalc including: center, right, and left justification, decimal places from -15 (for zeroes to the left of the decimal) to 37, commas, dollar signs, percentages, parentheses (for negative values), and the ability to fill a cell with a character.

Pocket Planner also contains a handy sort routine for sorting data contained in a rectangular block of cells (range). This range can be sorted alphanumerically by column or row, in either forward or reverse order. Of course, learning how to use this feature can save you quite a bit of time.

Another time saver is the Find and Replace command, which lets you easily locate specific data contained in your worksheets, and if necessary, replace each occurrence with something new. This can often reduce the amount of typing required for repetitive tasks.

If you own a Commodore 128, you'll love Pocket Planner all the more. Pocket Planner wisely makes use of the 128's additional memory by allowing multiple spreadsheet files to be stored in memory. This gives you the power to compare and even move data between the various worksheets. A press of the SHIFT and ALT keys toggles between the different spreadsheets stored in memory. The number of files you can have residing in memory at any one time depends on the size of the spreadsheets involved.

REU owners will appreciate Pocket Planner 2's ability to be used with Commodore's 1700 or 1750 RAM Expansion Unit (the 1750 Clone from SSI can also be used). The REU is used as a temporary "disk drive", where you can store and retrieve files almost instantaneously.

The 128 version also uses the 128's 80-column display, showing you more of your spreadsheet at one time. Also unique to the 128 version is the ability to navigate the pull-down menus, move the worksheet cursor, and define ranges with a mouse or joystick.

Now we come to the all important formula functions. If trigonometric functions are vital to your spreadsheets, Pocket Planner 2 is definitely the best program for you. It provides a whopping 24 trigonometric formula functions—the widest selection of the four programs reviewed here. Mathematical, statistical, and scientific formula functions are also available for your use. And the program also contains a powerful IF...THEN conditional function allowing values to be included based on a particular condition. On the minus side, you'll notice the lack of any financial formula functions.

Two print options are provided. The first, Simple Print, prints a single copy of the spreadsheet exactly as it is displayed on the screen. The second option lets you customize your printout. Here you have the choice of printing titles, boldfacing titles, printing sideways,

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selecting the pitch, lines per inch, and even the number of copies to be printed. Additionally, you may print the file to disk, permitting formatted spreadsheets to be saved for sending over a modem. But as you can see, there are no options for setting margins, compressing type, or selecting different fonts.

To sum it all up, I loved Pocket Planner 2. The program's display is very appealing and easy to use. But most of all, Pocket Planner 2 outshines the rest with its graphing capabilities. Pocket Planner 2 would definitely be the perfect spreadsheet program if financial formula functions were added. But then, if you haven't the need for these types of formulas in your spreadsheets, then Pocket Planner 2 is indeed the perfect spreadsheet program for you!

Calc II

Calc II is the third spreadsheet program in my investigation. This program is no longer available commercially, but can be purchased directly from its author, David Pankhurst. Calc II operates on a Commodore 64 (or 128 in 64 mode) equipped with a 5 1/4" Commodore compatible disk drive and Commodore compatible printer. A 95 page User's Reference Guide accompanies the Calc II program disk. Of the four programs, Calc II is the only program not available in a Commodore 128 specific version.

The first line of Calc II's screen display holds the edit mode flag, cell address, available memory, worksheet screen ID, and cell type flag. The second row is used for data entry. The rest of the screen is occupied by the worksheet area. Your screen display colors are easily configured with the function keys. Calc II can hold up to 240 columns by 240 rows or 57,600 cells worth of data, just a bit less than the previous programs.

At first, Calc II's screen may intimidate new users due to the lack of a menu. All spreadsheet commands are accessed by pressing Shift/Control key combinations, so you'll want to keep your manual close at hand. The following item may or may not bother you depending on your past history with other spreadsheet programs; most spreadsheet programs use letters to identify columns and numbers to identify the rows. However, Calc II reverses things by using numbers for the columns and letters for the rows. This is really no big deal especially if you've never used any other spreadsheet program. But for me, it seemed a little awkward. Calc II also makes use of a window or split screen display to enable distant portions of a worksheet to be viewed simultaneously. Up to four windows (A-D) may be used at one time. And, like SwiftCalc, Calc II offers an Auto-Calc feature to accelerate spreadsheet production.

Calc II's spreadsheet files are saved as program files. Therefore, Calc II does not have the ability to use spreadsheet files created with other programs which save their spreadsheet files as sequential files.

Most of the programs I tested contained only a few sample worksheet files on their program disks. Calc II contains over 40 "Overlay files". These overlays are great because they can be loaded and easily adjusted to suit your needs. Among these overlays are: a checkbook balancer, loan, mileage, mortgage, recipe, and sales slip worksheets. I bet you can put these to work right away!

Graphs are not one of Calc II's strong points. Calc II will suit you just fine as long as your needs do not extend beyond bar graphs. Numeric values can easily be formatted as a bar graph by pressing CONTROL B, selecting the range, and pressing RETURN. The cell values will then be represented by a bar the same width as the cell's numeric value.

A limited supply of cell formatting options are available in Calc II. The basic left, right, and center alignment options are present. But it won't be long before you'll miss the ability to format cells with dollar signs, percentages, and commas along with a find and replace command. Calc II does provide the ability to format cells with 0 to 14 decimal places and duplicate a chosen character across the width of a cell. Additionally, Calc II does offer the time saving data sort feature.

Calc II contains enough formula functions to meet the needs of most home users. You'll find a variety of formula functions to perform almost all routine mathematical, statistical, scientific, and trigonometric calculations. The powerful IF..THEN function is also included. Unfortunately, Calc II also lacks financial formula functions.

One of the most important features of any spreadsheet program is its ability to provide a print out of your spreadsheet masterpiece. Calc II provides two options: Simplified Print and a Flexible Print. The Simplified Print is used to print spreadsheets in their entirety or any range of cells beginning at cell A1. The Flexible Print option is used to print ranges starting at cells other than A1. Both print options allow you to select margins, print type (condensed or elite), and the number of characters per line. If you are printing a spreadsheet wider than 80 columns, any data over this width will be moved to another page.

All in all, Calc II is a great program for fulfilling your routine household needs. And thanks to all the fantastic overlay files included on the program disk, you can quickly put all your affairs in order. Calc II's User's Reference Guide is very detailed and even contains two chapters which walk you through the creation of a spreadsheet. The only downside is that it may take you a while to memorize all of the various key combinations for Calc II's spreadsheet commands. But, this problem can also be easily solved... remember Leroy's Cheatsheets? A blank cheatsheet would be the perfect addition to Calc II. This keyboard overlay could easily be modified to contain references for all of Calc II's key combination commands.

GeoCalc

You may be wondering why I saved geoCalc for last. Well, of the four programs, geoCalc is the only program which doesn't run straight from the disk. Of course, any GEOS user knows that geoCalc can only be run from the GEOS desktop. Both Commodore 128 and Commodore 64 versions of geoCalc are still obtainable. GeoCalc requires a Commodore 64 or 128, GEOS V1.2 or later or GEOS 128, and a 1541 or 1571 compatible disk drive. Optionally, a GEOS supported printer, RAM expansion unit, and a second disk drive, and a Commodore compatible mouse will greatly enhance your geoCalc performance. When used in combination with an REU, the geoCalc application is stored in the REU and frees the disk drive for your worksheet.

This greatly enhances geoCalc's operating speed. A mouse is also a nice addition to geoCalc. It is much easier to define ranges and perform other spreadsheet operations with the mouse than to remember the key combinations for the individual spreadsheet commands. A gray 9" x 7" three ring binder lends a nice touch to the geoCalc's tutorial-styled manual which contains a section devoted to walking you through the development of a geoCalc spreadsheet.

The geoCalc display colors can be customized through your GEOS desktop's preference manager. These preferences are then carried through to your geoCalc display. The display is similar to that of most GEOS applications. A menu bar is located at the top left of the screen and the title bar (displays title of the active spreadsheet) is located at the top right.

A Turbo Scroll Icon (only in the 128 version) is located between the menu and title bars. The Turbo Scroll Icon is used to quickly scroll through a large area of your worksheet. Below the menu bar is the data entry area. To the right of the data entry section is the current cell indicator, and the Restore and Enter Icons. The Restore Icon resembles an X and is used to restore information last contained in the active cell before you began to edit the cell. The Enter Icon resembles a check mark and is used to enter changes to the active

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cell. A split screen option is also possible with geoCalc. This option splits the screen in half horizontally, allowing two separate portions of a worksheet to be viewed at the same time. However, only data in the active worksheet may be edited. By clicking on any portion of the second worksheet it can easily be made the activate worksheet.

GeoCalc is compatible with other Geos applications such as geoWrite and geoFile. Text scraps from any of these applications can be pasted into a geoCalc spreadsheet. Similarly, text scraps from geoCalc can be pasted into a geoWrite document or a geoFile database. As you can see, this feature can greatly enhance your word processing and database capabilities and save you valuable time in the process.

GeoCalc worksheets limitations are considerably smaller than those of our other spreadsheet programs. GeoCalc data may be entered into 112 columns by 256 rows which adds up to 28,672 cells. And while we're on the subject of limitations, geoCalc does not have any provisions for creating graphs or toggling automatic calculation. Nor does the program have the ability to sort or find and replace specific data within a worksheet.

Cell formatting options are one of geoCalc's outstanding features. Not only can cells be formatted for commas, decimals, dollars, parentheses for negative values and scientific notation, but you can also choose the style of the characters within the cell. Cell contents may be plain, italic, bold, or italic-bold text. This feature alone can really spruce up the appearance of your worksheet especially for titles and row/column headings. And of course, cell contents can be right, left, and center aligned.

GeoCalc 128 isn't all that much different from geoCalc 64. As previously mentioned the 128 version features a Turbo Scroll Icon. This is certainly a handy feature, but not one I die without. Other than that, 128 users are treated to an 80 column display as well as the use of the numeric keypad.

When it comes to formula functions, geoCalc has an excellent selection. Formula functions are provided for mathematical, statistical, scientific, trigonometric, and yes finally, a nice selection of financial calculations! The only feature lacking is the If..Then function which won't be missed all that much by most basic users. Of all four programs, geoCalc provides the largest selection of financial functions for solving such problems as loan payments, present and future values of investments, along with interest rates, and investment terms. This feature alone may be enough reason to become a GEOS user.

Another reason to become a GEOS user is geoCalc's print options. Once you've clicked on print, a dialogue box appears in the center of your screen. From here, you have quite a few options at your fingertips, including: high, draft, or near letter quality print modes, the ability to print a range from cell x to cell y, single sheet or tractor feed, and printing grids and headings. Spreadsheets over 80 columns in size are printed on separate pages versus printing them sideways. I was impressed with the quality of my geoCalc spreadsheet print outs.

I must confess, I am not much of a Geos user and didn't expect to be pleased with geoCalc. However, for the purpose of this review, I thought I'd struggle through it. But, guess what? I really liked geoCalc. It discovered it is very easy to use, and in combination with an easy to understand manual complete with a glossary of spreadsheet terms, I highly recommend it for new spreadsheet users. I was also surprised to discover that of all the programs tested, geoCalc had the largest variety of formula functions. If only geoCalc could create graphs as well.

Conclusion

Well, we've reached the end of our available spreadsheet list. Hopefully, with all the above information, you've solved your dilemma of which program best suits your requirements. To make things a bit easier, I've included a handy comparison chart. So for now, consider this case closed!

Spreadsheets at a Glance

Program	Calc II	geoCalc	Pocket Planner 2	SwiftCalc
General Features				
128 Version	N	Y	Y	Y
Mouse support	N	Y	Y	N
REU support	N	Y	Y	N
Adjustable Colors	Y	Y	Y	Y
Menu System	N	Y	Y	128 Vers.
Window Option	Y	Y	Y	Y
Compatible With Other Spreadsheets	N	N	Y	Y
Interface Ability	N	Y	Y	N
Worksheet Size Limit (max. number of cells)	57,600	28,672	62,500	62,500 (128) 26,000 (64)
Graphs	Bar	None	Bar graphs	Bar graphs Line graphs Pie charts X-Y graphs Logaritmic
Sort Option	Y	N	Y	N
Find & Replace	N	N	Y	Y
Functions				
Mathematical	Y	Y	Y	Y
Statistical	Y	Y	Y	Y
Financial	N	Y	N	Y
Trignometric	Y	Y	Y	N
Scientific	Y	Y	Y	N
If..Then	Y	N	Y	Y
Printing Options				
Sideways	N	N	Y	Y
Margins	Y	N	N	Y
Fonts	N	N	N	Y
Type Attributes	N	Y	Y	Y
Print Grid Option	N	Y	N	N

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SOFTWARE IN REVIEW

CKit 94

Mad Man's Backup & Compression Utility

CKit 94; $39.95; by Mad Man Software 1400 E. College Dr. Cheyenne, Wyoming 82001. Also available from CMD.

"Snakes. Why'd it have to be snakes?" The line from *Indiana Jones Raiders of the Lost Ark* runs through my mind everytime I see the the manual cover for The Compression Kit, with a Boa Constrictor squeezing a disk drive. CKit 94's snake is a gentle, friendly snake. It doesn't squeeze too hard, but considering its other virtues one can almost overlook that the compression of files isn't as tight as less-friendly utilities. Given the care that has gone into creating a system to backup important data, you could almost say the snake *hugs* your data instead.

The Compression Kit includes:

Filemaster - used to copy, delete or move files.
Procopy - disk copier.
Archiver - combines and compresses multiple files into single or multiple files.
Boa utilities - compresses entire 1541, 1571 or 1581 style disks into single or multiple files.
CMD Native Boa - compresses entire CMD native partitions into single or multiple files.

Each of the compression utilities will decompress its own type of compressed file. A utility to convert archive files into self-dissolving ".MAD" files is also included. A separate program, "Decomper", comes with the system and can be uploaded to bulletin boards or given to other users. It allows those who don't own the CKit to dissolve files created with it.

CKit 94 is a power users utility package. It works with any CMD storage device (like HD hard drives, RAMLink or FD drives), PPI's RAMDrive, all Commodore disk drives or 17xx REU's (even expanded ones) and the CLD Super 1750 Clone. It's *not* for users with a single 1541 disk drive without any form of RAM expansion. The more RAM you have, the faster and easier CKit operates. When installed on a CMD device or RAMDrive it returns to the partition it was loaded from to load in different utility modules. Installing CKit on a CMD device is as easy as copying it to a partition.

CKit operates only in C64 mode, but 128 users have an advantage since it will use the 128's VDC RAM (16k or 64K). It can also be set to kick into 2 MHz mode on 128 computers during compression operations to get the job done quicker; but due to the way Commodore serial routines work, it must revert back to 1 MHz for actual disk operations.

For copying and compression use CKit will use any RAM enabled in the setup menu, allowing expanded REUs to use all available RAM for operation and uses RAMLink or RAMDrive DACC partitions in the same manner, up to the limit of 16 megabytes. The REU is not used as a disk device, but instead is utilized for memory during copy and compression functions.

Each time you start CKit, it checks the system for the Security Key (a dongle which fits into joystick port #1), determines which type of computer it's being used on (64 or 128), then checks for available RAM devices. The opening menu includes a "Settings" option to select screen blanking (2 MHz mode), and to set preferences for the type of RAM it will use. From the Settings menu the available RAM (REU, DACC, VDC or 64/128) can be tested to ensure integrity. Warnings are given before the test begins, as this will wipe out any data currently residing in the RAM.

Backup Utilities

CKit appears quite able to handle any style of backup needs a user might have. Each of the utilities contain an option to toggle verification checks for the process of copying, compression or decompression of files. Verification slows down the backup process, but gives peace of mind by double checking the data. For day to day use it may never be needed; but for important data, it's worth the extra time spent to ensure reliablity.

CKit provides two different file naming methods when compressing data. The first is CBM style, allowing up to 12 characters for each file name. CKit adds an extention to whatever name you provide to designate the type of archive. Filenames are padded out with spaces to the Commodore maximum of 16 characters. The second file naming method limits you to eight characters for the filename and three for the extention (which CKit adds automatically depending on the archive type) to provide names which are acceptable to MS-DOS Bulletin Board Systems.

Filemaster

Making a copy of one or more files so you can have duplicates available for immediate use can be easily accomplished using CKit's Filemaster utility. Files are first copied into RAM, then copied to the destination disk or partition. Filemaster's copy and move features will let you automatically skip or replace files if a file with the same name already exists on the destination disk; you can also ask the user what to do with each duplicate it finds. Files "Moved" with

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CKit are first copied to the selected destination, verfified against the original (if verify is toggled on), then finally deleted from the source.

Procopy

This utility is used to backup (copy) whole disks. During copy process, Procopy reads as many disk tracks as will fit into available RAM, then copies them to the destination device. If the entire disk you're copying will fit into memory, Procopy asks if another copy of the same disk is desired; if you answer yes, then all subsequent copies are made directly from RAM.

Archiver

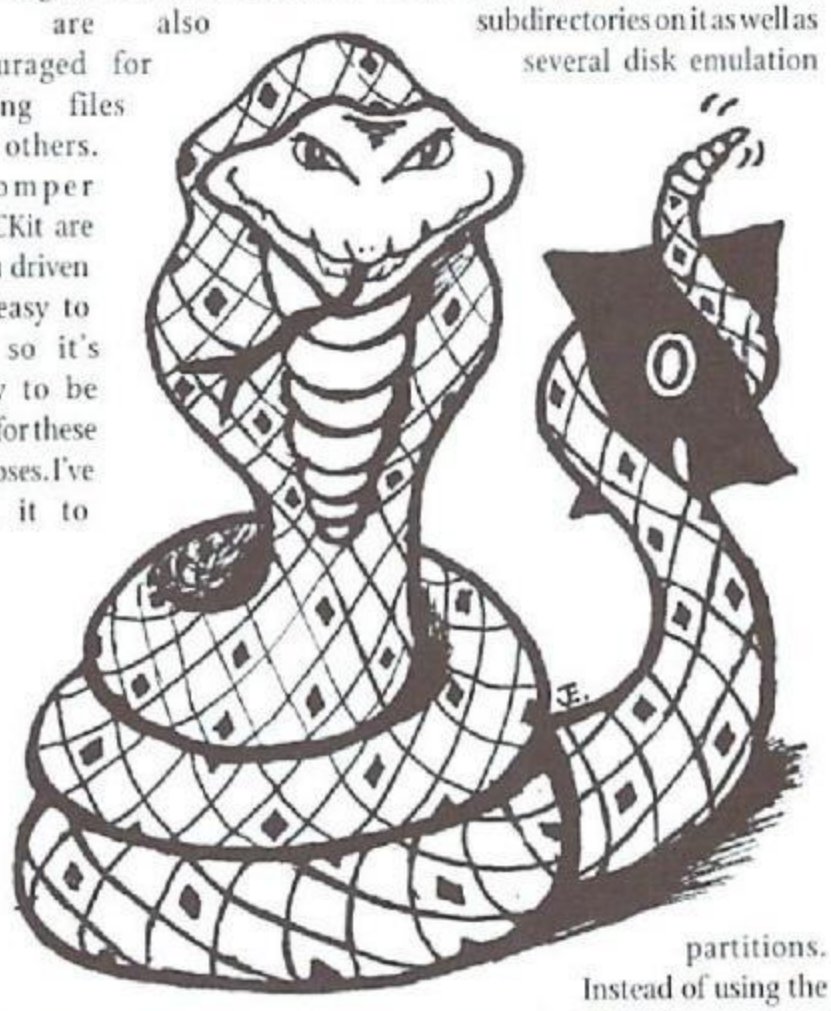
Used to backup files or disks that don't need to be immediately available—or to create a backup of large storage devices like RAMLink, RamDrive or a CMD hard drive. The Archiver combines and compresses mulitple files, plus allows a block limitation to be placed on the size of the backup files. This allows multiple disks to be used when backing up large amounts of data. The limits range from 100 to 1,000 disk blocks or "None" (such as when the size of the archive isn't important). The Archiver only compresses individual files and is recommended over using the disk Boas because its compressed files are usually smaller and the process takes less time. When files are decompressed the user has the option to skip, replace or be asked about like-named files that already exist on the destination.

The Boa Utilities

These utilities compress entire disks, CMD disk emulation partitions, or CMD Native partitions by track and is useful for making backups of specialized disks or partitions. This can be a disadvantage if the source has a lot of empty blocks or scratched files, since each disk track is read, compressed and added to the archive, regardless of whether it's in current use. The Boa utilities also allow a size limit so that multiple disks can be used when backing up larger capacity disks or partitions to lower capacity devices. For the CMD Native Boa the destination size ranges from 100 to 20,000 disk blocks in increments of 100. When decompressing Boas, warning is given that anything currently on the destination disk or partition will be deleted. The process can be aborted at this stage.

Sharing Files or Disks with Others

Since the Decomper program can be freely distributed, Mad Man Software encourages CKit owners to provide it when distributing compressed files on telecommunications services or within user group libraries. The self-dissolving MAD files created with CKit are also encouraged for sharing files with others. Decomper and CKit are menu driven and easy to use, so it's likely to be used for these purposes. I've used it to send files to others and felt comfortable knowing that they would have a true copy of what I was sending. Modem users often call long distance for files and prefer files which are compressed tighter than CKit currently allows, but CKit's reliablity and ease of use should be considered a plus. If the file becomes corrupted during the download, the user is told *before* the files are decompressed. The CKit is equally suited for mailing disks with Boas or Archives due to its verification of files. In fact, the original intent of the software was for Mad Man's own programmers to have a way to send each other programming files which were guaranteed to be *exact* duplicates of the originals.



In Practical Use

I've used the Archiver to combine text files that seem to collect on my disks the same way some people have coat hangers multiply in their closets; I've used it for the purpose of backing up my CMD devices. I found using the Archiver to be the fastest method for both backing up and restoring data. When I backed up my hard drive, I had one very large Native mode partition with many subdirectories on it as well as several disk emulation partitions. Instead of using the Boa utility for the Native directory I used the Archiver to create compressed files of the Root and each subdirectory. I also used the Archiver for my disk emulation partitions, selecting all the files in each partition. When I named the archives, I used names which would let me know where the files within belong, such as '1utils' tells me the files within belong in partition #1, in the utilities subdirectory. I used the same technique recently with my RAMLink, and then completely erased the contents of it so I could rearrange the partition sizes. It took less time to restore my files than it has using any other method I've used in the past.

I've found the archiver useful for moving a lot of small files, such as Print Shop graphics, from a slower device (like a 1541) to my hard drive. Since I had several 1541 disks with these graphics, I compressed the contents of each disk in one session to archives on my hard drive. As I dissolved the files, I opted to skip any duplicated file names. I didn't have the patience to test my theory, but I'm positive this took much less time than it would have to copy the files individually while skipping like named files.

The "Move" files feature is something I find I use often, and miss in other copy programs since it saves me the step of deleting the files after copying them, if this was my intention.

CKit also gives access to 1581 style subpartitions, which I found useful for getting my data out of these subpartitions and onto my hard drive instead. I found that if I loaded CKit while I had a partitioned 1581 disk in the drive (with a partition active instead of the root directory) that CKit would crash as soon as I tried to select the disk drives to use. The solution was to load CKit without a disk in the drive and then inserting it prior to selecting drives.

Grumbles

Power has a price. Mad Man appears to know the value of a good thing and has protected CKit in a manner that makes it easy to copy the system onto other drives—but without the Security Key, the program will not operate correctly. Considering the amount of work that has gone into this utility, it may be the only way for the Mad Man to receive fair compensation for their efforts; but some users will likely refuse to buy the software because a security dongle is required.

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The previous version of the Compression Kit had complaints about its speed of operation; but with CKit 94's use RAM and the 128's 2 MHz mode for compression routines, this complaint is no longer valid. CKit 94 is much faster than previous version. Unfortunately, files compressed with the earlier version cannot be decompressed with the newer one. This wasn't mentioned in the updated documentation, and should have been.

The Decomper program is a means of showing what the CKit system is like to those who don't have it. Unfortunately, it doesn't use some of CKit's finest features such as using REU or DACC partitions for faster operation. It operates in 64 mode without the added benefits that CKit gives 128 owners. I'm grateful that Decomper exists, but I feel it doesn't do the commercial program justice.

Since the utility to create self dissolving .MAD files works only on archived files which are 192 blocks or less, I find it frustrating that there isn't an option in the Archive utilities to limit the size of the archives to match this size. Users can elect either 100 or 200 disk blocks as the limits and hope for the best if they choose to use the 200 block limit.

As previously mentioned, the compression of files still leaves something to be desired; but in backing up graphic files CKit surprised me by compressing the already tightly compressed Fun Graphics Machine "Clip Art" files. Accuracy over compression has been the theme of both versions of CKit that I've used, and to this end, it does as it claims.

My last grumble is my biggest. I like the CKit and I have several things I'd still like to see implemented that I think would benefit many users, especially where the Filemaster utility is concerned.

I was disappointed when I read in Commodore World's Issue #5, "Mad Man Update" that this is expected to be the last release of the CKit. As it stands, the system is excellent for power users who want to back up their hard drives and RAMLinks. I'd like to see it push the envelope a little further, though, and combine features which are available in CMD's FCOPY+ program, such as the ability to rename files, create and remove subdirectories, make use of selective directories, and or use the real time clocks (RTC's) in CMD devices when listing files for processing.

Also very high on my list is the ability to extract single files from an archive. CKit allows the user to view the files in archives and this would be a logical place to add the ability to highlight a filename and have it be extracted. I hope that perhaps Mad Man Software can yet be persuaded to continue their efforts with this utility.

Wrap Up

While it may not compress files as other utilities might, CKit's user friendliness makes it much easier touse than any other compression or backup utility available. It's meticulous in creating acurate archives and copies. When it comes to backing up important data or storage devices like a hard drive, accuracy is a must, and this is what CKit delivers.

- Gaelyne R. Moranec

KARMA

A New Assembler for the Commodore 128

Karma V1, by Brett J. Tabke: PHD Software Systems, Box 23, Moville IA. 51039-0023. Suggested list $59.95 (plus $15 shipping).

Karma is a fast and full-featured macro assembler for the Commodore 128 only. It shares many operational features with an earlier assembler, Buddy, in that it allows source code to be stored in either program or sequential files. Karma is especially rich in the types of labels (symbols) that are allowed. Karma has a few syntax oddities that may take some time to get used to, but most programmers will find its environment familiar.

It's good to see a new assembler for the Commodore 8 bit computers. The older ones, such as PAL, BUDDY, and Commodore's original Developer's package (HCD) were getting hard to find. And the arrival of a new product is a reassuring sign that these machines are still viable.

Traditional assembler systems come in two chunks: an editor, where you prepare your source program; and an assembler, which translates it into working code. The Commodore HCD works this way, and though it is slow, it is capable of assembling huge programs.

PAL takes a different approach: let the built-in Basic system be your editor so that the assembler can pick up the code directly (in "tokenized" Basic) and do the job quickly. The BUDDY system allows you to use either or both methods; so does KARMA. It might have been nice for the KARMA package to include a sequential editor, but that's no problem for most users: good editors such as ZED128 can readily be used.

The Package

KARMA comes as a single 5-1/4 inch disk, plus a spiral-bound manual of approximately 70 pages. The disk is non-protected, and the wise user will start by making an archival backup. The disk contains not only KARMA, but also a disassembler called UNKARMA. UNKARMA will be of limited use to most users. The disk contents are carefully sized so that its contents can be read on a 1541, in case the purchaser does not have a 1571.

The manual is thoughtfully written. It compares KARMA characteristics with that of other assemblers, without boasting of KARMA's superiority. It comes with an appendix and index to help the reader find a specific subject. And many programmers will like the spiral binding, which allows the document to lie flat on a desk.

I wish the manual started with a walk-through for the beginner. It's reassuring to be invited to install the assembler, write a few lines of code, assemble them, and then see the results. It's also a good way to ensure that your program has arrived in good order.

The documentation is quite readable; headings are underlined and bold-face type is used where appropriate. A minor annoyance occurs near the beginning: a couple of example lines start with 'ex:', apparently meaning 'example'; the user should not type this in, just the rest of the line.

Installation and Setup

KARMA will install itself into a high area of Bank 1, and will stay there until the 128 is reset or powered down. When you want KARMA to

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go to work, a SYS command will fire it up. Meanwhile, you can run other Basic programs as usual; KARMA will have no effect on them.

To do an assembly, you must load some Basic code. This must include a SYS call to crank up KARMA. The code loaded into memory might also include your source program, but your source code can remain on disk if you wish. Such a code may be called in by using directive '.file' (for Basic-style files), or '.seq' (for sequential text files). You can call in multiple files this way, so that your program can be written as a series of files. There are provisions here for using the 128's burst mode loading, which will greatly speed up disk file reading.

There's a rich set of other directives. Conditional assembly uses an if .. else .. endif structure, and the '.if' options cover not only true or false, but also whether a symbol has been declared or not. 'If' structures do not nest, but that's not hard to get around. Macros don't nest either, but they are set up flexibly with multiple parameter passing. Oddly, the Karma group state in the documentation that they don't like macros and never use them! Many other directives are available; for example, the offset directive '.off' allows you to generate code that will be moved to a location other than its original load address.

Gaps and Oddities.

The assembler does not support logical operators such as AND and OR (the Op Codes AND and OR are there, of course). These operators are rarely used, but can be needed on occasion. For example, if you wanted to move the assembly point to the start of the next memory page—perhaps to set up a table that fits entirely on one page—you might want to perform a calculation similar to this:

```
ProgramCounter= (ProgramCounter
+255) AND $FF00
```

I can't see a way to do this in KARMA.

An interesting innovation in KARMA is the way it treats operands that start with any of the symbols: '<' (low byte), '>' (high byte), '"' (Pet Ascii), or '@' (Screen Ascii). These all trigger immediate-mode addressing. Such expressions would normally need to start with the '#' character to signal this, and KARMA allows you to code it this way, too.

Many programs have crashed because a programmer forgets to include that immediate character; the KARMA syntax will save a lot of this. My personal preference would be to get a warning message when the '#' was left out; KARMA just goes ahead and assumes immediate mode.

One oddity of this scheme is that `LDA "a"+1` will generate code different from that of `LDA 1+"a"` ...if the special symbol doesn't start the operand field, immediate mode will not be triggered. Adding the '#' character will fix everything, of course.

There are minor format anomalies. For example, ROL (Rotate Left) of the A register *must* be coded as ROL alone. 'ROL A' doesn't work. Messages can be sent to the screen during the assembly process, but the '.msg' commands don't automatically terminate with a RETURN; you have to code this in manually.

Symbols and Labels

KARMA is generous in its allowance of symbol/label formats and types. Symbols such as 'the.secret.number. of.karma' are no problem, although programmers tend to stay clear of very long symbols for fear of writer's cramp. KARMA also has a good set of temporary symbols, popular for coding short branches and tiny loops. These come in two styles: the plus and minus symbols (branch ahead to the next plus symbol; branch back to the last previous minus symbol), and the 'lira' symbols.

You might think of the 'Lira' symbol as that used for British "pounds" currency. Whatever you call it, it helps to define temporary labels that can be used in a local area of the code. You may have run across other assemblers which use similar schemes with the dollars symbol, for example, local labels called 3$ and 5$.

As the manual correctly points out, you can't start a line with a numeric character when you're working in the Basic editor, and a numeric starting with a dollar symbol would be taken as a hexadecimal value. So, the Lira was substituted, and it seems to work well when there are no coding errors. When such errors occur, the assembly output and reports are confusing; perhaps the symbol table gets muddled.

The Disassembler

The UNKARMA reverse assembler seems to me to be of use only on the smallest, simplest programs. Without intelligent interaction between computer and human, it's impossible to guess and correctly decode complexities like tables of jump addresses, or high/low byte setup for indirect pointers. The few good reverse assemblers I have run across allow the user to construct a table, sometimes elaborate, that says how to interpret the various bytes of the program.

The complete source listing for UNKARMA is useful, however. It lets the user see the kind of coding style that can be put to work in KARMA projects.

Conclusion.

This is a good, fast, and powerful assembler. It's specifically tailored to the Commodore 128 and makes good use of features such as burst-mode disk activity.

- Jim Butterfield

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GAMES MINIVIEWS

Blood Money
Psygonosis Ltd.
Available from CMD

I have this really annoying habit of waking up extremely early, even on weekends. This Saturday, like most, my eyeballs unwillingly popped open before 8 a.m. While listening to my daughter "sawing logs" in the other room, I decided to enjoy my "quiet time" (the blissful time that I have all to myself before my daughter wakes up) by going on a "kamikaze quest for gold and glory". At 8 a.m., with the use of my C64 and Blood Money, I ventured into a land containing four Outer Planets, alien life-forms, challenges beyond belief, colorful graphics, great music and sound effects.

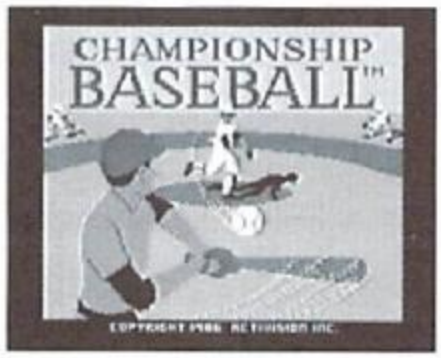
Blood Money's initial screen gave me a choice of playing either a one or two player game. Since I thought it would be rude to wake my cohort, I settled for a one player game. The two player option allows a comrade to assist me in destroying the aliens. Here, I could also switch between music and sound effects. Additionally, during game play, I could also use the F3 key to toggle between sound effects and music. By the way, both effects in this game are great, especially the music. For the time, I settled for the sound effects to help restrain my natural tendency of cranking up the volume while listening to a great tune. The third option allows me to decide the level of game play—patient or impatient. I must admit, once I'd tried out both of these options, I couldn't distinguish between either of them.

The manual quotes Blood Money as an "Alien Safari across the untamed horizons of four hostile planets." What a unique way to start my weekend! The journey begins with an allotment of 200 credits. The first 100 of these credits will be spent on admission to the first planet known as Gibba. Admission increases by 100 credits for each of the three successive planets—Grone, Shreek, and Snuff. When the game began, I found that my vehicle, controlled by a joystick, looked more like a helicopter than a space ship. It didn't take long before I met up with a whole host of aliens in addition to randomly placed bomb-shooting weapons. I discovered that the obliteration of some life-forms resulted in floating credits. The only way to grab these credits was to quickly but skillfully guide my ship into them. Not an easy task when you've got a slew of aliens on your tail.

During my trip, I needed to accrue enough credits for admission to the next planet. Also, I found stores at various locations. At these stores I could use my credits to purchase missiles, bombs, thrusters, health and efficiency boosters, and extra bodies.

How addicting is this game? Well, at 10:30 a.m., my daughter finally managed to drag me away from the screen. It was either that or she would have died a certain death due to starvation. It amazes me that I haven't heard of this game before. Perhaps because it's yet another space game. After playing so many space games, I will undoubtedly be prepared for the inevitable day when I will be at the helm of my own lazer-equipped spaceship! Beware of ships bearing the QT symbol, because heaven knows, my cohorts and I have had plenty of advanced training!!!

- Sherry Freedline



Championship Baseball
Activision
Available from SSI

As a youngster, I rarely enjoyed a game of baseball. Just like a magnet, I had an uncanny ability to attract that hard baseball to my body. However, I do enjoy going to see baseball games, as well as watching them on TV. Now, with Activision's Championship Baseball, I can actively participate without the fear of injuring myself.

Championship Baseball's opening screen displays three different game options: League Play, Exhibition Play, and Batting Practice. As a new player, you may want to practice your swing with the Batting Practice option. Here the pitcher throws the same variety of pitches as in the actual Championship Baseball games. You may opt to "bunt" or "swing away". To select your desired swing, you must time the press of your joystick button; press it before the ball is pitched for a bunt, and press it after the ball is pitched to swing away. A few practice swings and you'll be ready for the big time. When you've had enough, you can press the F5 and F7 keys together to move on to a real game.

You'll need to choose between League Play or Exhibition Play before you can play an actual game. If it's a one-player game and you don't care to draft your own team, select Exhibition Play. If you'd like to play a two-player game against a live opponent, you'll also want to select Exhibition Play. But, if you want to play a one-player game with a team of your own creation against the computer, then choose the League Play option.

At times you'll want to draft your own team, such as in two-player Exhibition Play and one-player League Play. You'll need to supply your own data disk in order to save your team configuration. Once you've elected to draft a New Team, you're asked to name your team. Then you'll cycle through the infield and outfield positions, catcher, 3 pitchers, one reliever, and 2 reserves with a choice of two different players for each position (player A or B). Each of these players will have varying skill ratings. Players A and B will either be a Liner or a Slugger and will be rated for Batting, Catching,

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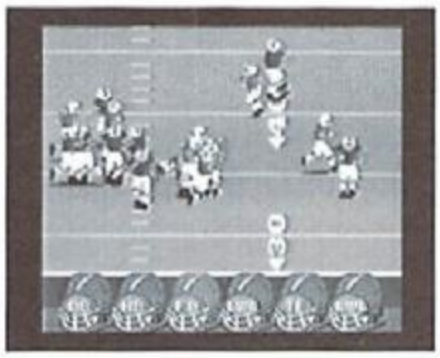
Running, and Throwing. Once you've selected either A or B, enter the name and you'll move on to the next position. Pitchers are rated according to their Speed, Control, and Stamina.

After your team is drafted, organize your line-up, choose your division, and it's time for the first pitch of the game. I found the game play to be a little difficult. First of all, while up at bat, it takes a while to learn exactly when to press the joystick button in order to hit the ball. Though once you've practiced this a bit, it does get easier. When you're playing the field, you control ALL the players. You really need quick reflexes to be able to catch the ball and get it to the desired base to tag the runner out. But, practice makes perfect, and at least it's fun to practice.

Win the division by ending your five game season with the best record and you'll advance to the one-game playoff against the champion from your paired division. Win the playoff game to move up to the Championship series. The Championship is won by the winner of 2 out of 3 games.

The game looks good and sounds equally as good with cheers from the crowd. The game comes complete with a manual which provides easy to decipher instructions on how to get up to bat with Championship Baseball. Joysticks are required as well as a blank disk or disks depending on the number of live players. You'll also need to clear a block of time to play through a whole game, after all, there are nine innings to a game. Oh, one last thing: you'll need to supply own peanuts and popcorn!!

- Sherry Freedline



ABC Monday Night Football

Data East

Available from CMD

The end of the football season no longer has to mean the end of Monday Night Football. Thanks to the folks at Data East, this popular weekly pass-time can be enjoyed every single day!

By now, almost everyone knows what a huge Pittsburgh Steelers fan I am. Last year we were treated to a thrilling season, even though it ended two weeks sooner than expected. With all the playoff excitement in the air, it was definitely the perfect time to review ABC Monday Night Football.

Complete documentation is provided with an instruction guide and fold out Commodore 64/128 instruction card. Since I'm not familiar with all the intricate details of football, I thought it wise to thoroughly read the manuals, which, by the way, are very well done. They even contain a glossary of football terms. Still, after reading both sets, I had no idea what surprises awaited me on that innocent looking floppy disk.

I popped the disk into the drive, issued the load "boot", 8 command, and...wow!...my jaw about hit the floor! I was honestly surprised! I expected the great graphics, but certainly not the digitized speech. Right then, I knew this was one of the coolest games I've reviewed to date.

Once you enjoy the opening screens and a guest appearance by Frank Gifford, the Game Options Menu appears. Choose your preferences for Field Goal/Extra Point, Cheerleaders, and Half-time/Game Over settings.

Then it's off to the main game menu where seven different game options await. I was glad to see a one-player practice option. This is a fantastic option for first-time players. The next three options allow selections of competitors for exhibition games. These are followed by alternatives for playing a playoff series with up to ten players! Finally, a demo mode allows sneak peeks of the game.

Yet a third menu can be accessed by hitting the Run/Stop key. It is very important because it is where the strengths and weaknesses of team players may be modified. A Playmaker Utility is also available from this menu enabling you to create your very own plays from scratch.

Finally, it's game time! Before every play the Play Selection screen appears. At this time, both the offense and defense can select their next plays. Then, it's off to the line of scrimmage. And the fun begins! Digitized speech announces the "huts" and "hikes".

Of course, after the "hike" is hollered, the center snaps the ball to the quarterback, which, lo and behold happens to be you! At the bottom of the screen are a row of helmets representing each of the possible receivers. Cycle through each of the helmets by holding down the joystick button. When the desired helmet is highlighted release the button and you become the intended recipient of the football. The computer now controls the quarterback and tries to complete the play. It will take a bit of time to get accustomed to selecting your receivers because these decisions must be made quickly before the defense sacks you. Thankfully, you can't forget which player you are controlling due to a triangle icon reminder. Of course, after playing offense, you'll also get a chance to play defense.

This game is just packed from byte to byte with every imaginable feature. Half-time Cheerleaders, music, and even an ABC Monday Night Football Trivia Game are some of the cooler features. Unfortunately, there are way too many features to explain all in this "mini-review". So there's only one way to find out...play ABC Monday Night Football, you definitely won't be sorry, although your spouse may be!

- Sherry Freedline

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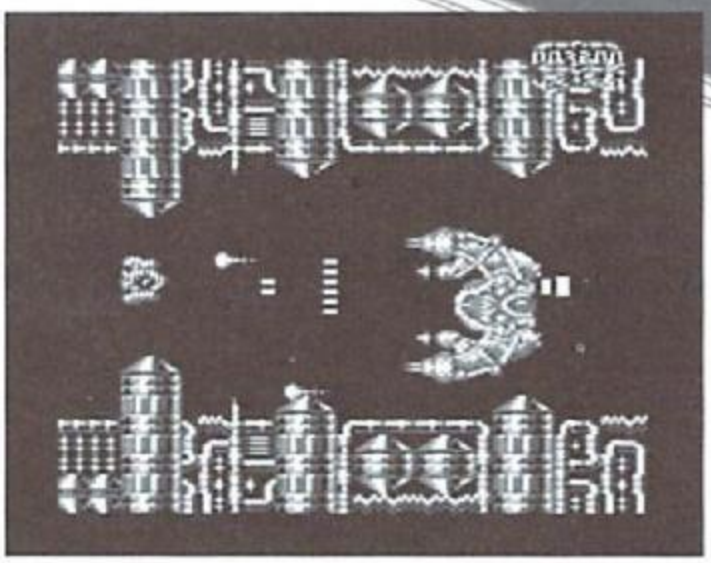
New GAMES



Lions of the Universe

$19.95; Electric Boys Entertainment Software; Creative Micro Designs, Inc., P.O. Box 646, East Longmeadow, MA 01028-0646; (800) 638-3263.

Lions of the Universe is the second all new game brought to us in recent months from the folks who call themselves Electric Boys. Unfortunately, the days of drooling over an abundance of Commodore games has long been gone. So of course, it's great to see new games still arriving on the scene. Now we really need to be grateful for those programmers still creating new programs for our beloved machine.

Lions of the Universe is not just another space game. It is one of the most unique and challenging space games I've played to date. The Lions are starfighters for the Omacron sector of the galaxy. And, as most space games go, their sector is being attacked by alien forces. As the top Lion, you must save your sector from these menacing creature ships.

So, you're probably wondering, what is so unique about the game to justify its purchase? First of all, the alien attackers consist of space ships which usually swarm in groups of at least four or more. Right from the very start, you'll notice they don't just fly right at you. They travel in random dance-like patterns. Sometimes they'll even come at you from behind. From level to level, you'll never know what to expect next. This makes shooting them quite a challenge, but it can be done, you'll just need to be quick on the trigger. And fortunately, you'll find help scattered along your travels in the form of "glowing weapon icons". The icons change as you shoot them. When you see a desired weapon, simply fly into the icon to arm your ship. The weapons will provide you with the capability of shooting in various directions at one time. Try to collect as many as you can, otherwise you won't be able to get very far into the game.

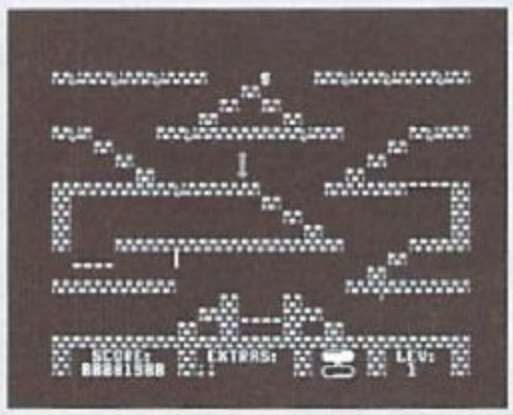
At the end of each wave of alien spaceships, you'll be greeted by an angry "Mega Guardian". Their demise (yes, sometimes there are more than one of these big guys) requires patience and a well-armed space ship. Conquering these awesome monsters is rewarded by advancing to yet another even more challenging wave of aliens.

Secondly, a truly awesome soundtrack adds to the game's overall unique gaming experience. The combined music and sound effects, along with bright colorful graphics keep you coming back for more and more.

Now for the downside...CMD distributes the NTSC version of Lions of the Universe. Overall, the game translated very well but depending on your system, you may experience brief periods of screen flicker. There isn't much that can be done to overcome this problem. Lions of the Universe was programmed on a PAL system which uses different timing systems than our own NTSC Commodores.

Due to these and other differences, many PAL programs can't be used at all on NTSC systems. Luckily, Lions of the Universe is one of those programs that converted well for NTSC systems. Otherwise, NTSC Commodore system owners would have to do without such a great game. In the future, I hope we see more great games from Electric Boys. They are definitely a talented group!

- Sherry Freedline



Super Pogo Stick

$11.95; Yanney Software, P.O. Box 224, Lebanon, PA 17042-0224.

I am always happy to see brand new games introduced into the Commodore market. In recent months, Super Pogo Stick is one of four new games that I've noticed. This is fantastic news for all diehard Commodore users!

Super Pogo Stick is contained on a single 5 1/4" disk. In addition to the game file, the disk contains 30 different mazes contained in 6 maze files. However, only five default mazes can be used during one game. To change the default maze file, you'll need to rename one of the maze files. Also supplied on the disk is a BASIC program to create your own challenging maze files.

The very second I began playing Super Pogo Stick, my mind instantly recalled the infamous Lode Runner game by Broderbund. However, there are quite a few differences between the two games,

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and playing Super Pogo Stick is indeed a unique experience.

Each game screen features a maze containing a series of brick ledges. Some of the ledges contain dislodged bricks. Your goal is to safely make your way through the maze and pop them back into place by moving your pogo stick over top of them. Elevators, steps, and up to nine different obstacles can make reaching the bricks quite a challenge.

The only way to progress to the next level is to repair all the dislocated bricks. Points are earned by completing levels and repairing bricks, as well as guiding your pogo stick over randomly placed dollar signs, question marks, mystery eggs, hour glasses, and mini pogo sticks. The hour glass also increases your time and the mini pogo sticks will reward you with an extra life.

I love the game play along with the bright, colorful graphics. However, the sound effects truly annoyed me. I could turn down the volume, but a game without sound is just as bad as a game with disturbing sound effects. I'd love to see an updated version of this game released featuring new sound effects and/or a catchy musical tune. The best attribute of this game is it never grows old because once you've conquered each of the included mazes, you can create all new mazes to conquer!

-Sherry Freedline

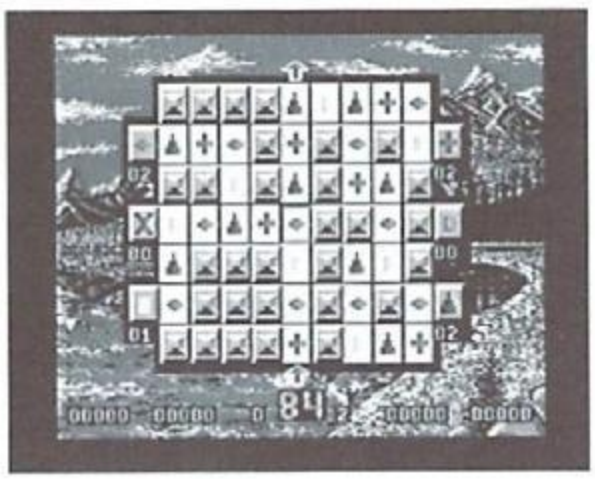
Riddles And Stones
DM25 (German Marks); Rene Lerch, III. Wendung 9, D-23970, Wismar, Germany; 03841/615859

You'll find a story tucked away in the documentation for Riddles And Stones, a dramatic piece of writing which provides you with some kind of a back story for the game; an excuse for its existence, so to speak. It has to do with a spooky mansion and thunder and lightning and all that sort of thing. Read it; it's pretty cool. Don't let that story fool you, however. This game doesn't require any excuses at all.

Riddles and Stones is a dream. It is clearly evident in every detail that this game was a labor of love. If you aren't convinced of that just by watching the beautiful graphics or by listening to the music, you will be once you read the history of the game's creation.

The manual includes that story as well. Years of work went into it, not only in creating top-notch graphics and music but also in developing the basic concept into an elegantly smooth game loaded with user-friendly features.

As with so many excellent strategy games, Tetris being a prime example, the game is simple to learn and easy to conquer at the lower levels. Essentially, you need to pick up stones and place them in a path from one edge of the square playing field to the other. The symbols on the stones you place must match the symbols on the playing field where you set them down. Oh, and stones move until they hit something. That's about it.



Of course, as the levels slip by oh so smoothly, little challenges present themselves. There are suddenly two possible paths to take or a simple wrong turn that makes it impossible to stop a stone from bouncing back and forth. Fancier spaces find their place on the playing field, giving you the chance to skip back and forthor jump walls. It take more and more concentration and careful planning to complete a field. And before you know, you've spent hours at it.

Riddles And Stones is a game written by a devoted Commodore gamer and it shows in some of the exceptional features incorporated into the game play. For example, each field in each level has a password, which saves you the trouble of playing the same levels over and over as you work. If a field stumps you, you can try it over again without having to reboot by pressing a function key.

The manual, while heavily spiced with personal anecdotes, finds plenty of room for the important stuff, the game rules and setup. If that isn't enough, you can send for a list of all the passwords and all the solutions so you can move around and see the pretty pictures or just jump ahead and play a particularly hard level for the fun of it.

Unfortunately, Riddles And Stones is not compatible with extra peripherals. I had to disconnect my RAMLink and my second disk drive in order for the game to progress past level one.

This isn't critical, I suppose, but if I have to disconnect things to play a game I am less likely to play it. The manual does clearly state that you need to remove any extra drives, so at least the author is up front about it. And hey, Riddles And Stones is one game that would be worth a little extra effort to play. It's simply one of the best games I've seen for the Commodore.

- Steve Vander Ark

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HARDWARE

Collectibles

The Commodore 264 Series

The Commodore 264

Have you ever gone to a garage sale or flea market and noticed a machine that looked similar to a old brown bread box 64, except that it was black in color? In the late 1980s, did you ever see an ad from a liquidation company called C.O.M.B. that was advertising a Commodore machine called a Plus/4? If so, you have seen a member of the Commodore 264 series.

To understand why these machines are noteworthy, we must go over a bit of Commodore history. Now, stay with me, this won't take long.

As many of you know, CBM stands for Commodore Business Machines, and Commodore sold just that: Business Machines. When Commodore introduced computers to supplant their calculator and business furniture sales, they targeted the business sector. The result was the successful PET/CBM line of business computers. However, in the early 1980s, Commodore decided to target the emerging home computer market with the VIC-20, partly because that market looked promising and partly because Commodore needed to recoup losses on a specialized graphics/sound chip that Commodore developed and unsuccessfully marketed to video game companies. This chip, the VIC-I, formed the heart of the VIC-20, giving the chip a second chance. Well, the VIC-20 surpassed Commodore's sales expectations, and the C64 became one of the best selling home computers of the 1980s. Notice, though, that all this time Commodore was focusing on the home market. So, in late 1984, Commodore remembered its business roots and unveiled a new line of business computers: the 264 series.

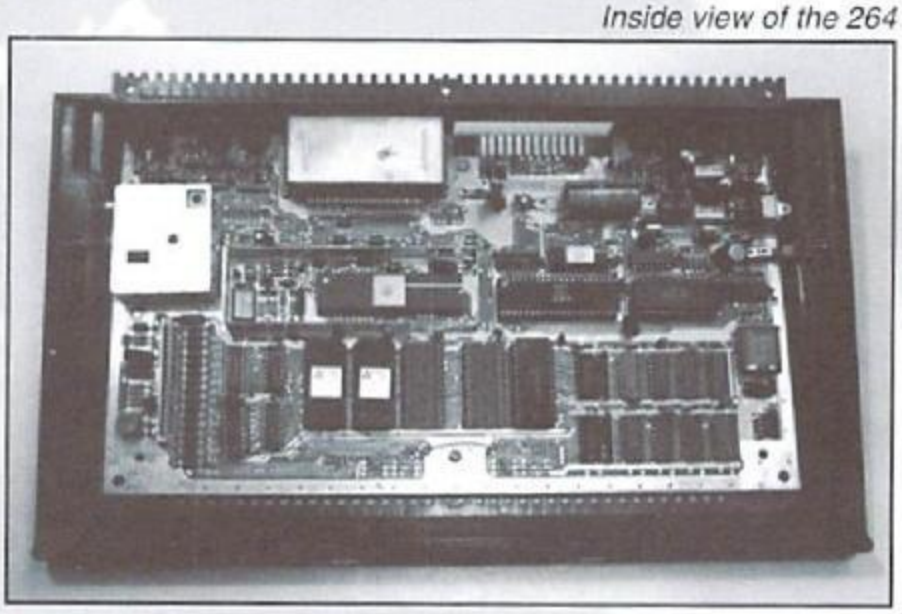
Originally, two computers made up the 264 series: the Commodore 264 and the V364 (or CV364 or 364V, depending on which references are used). At the low end of the line, the 264 machine sported the following features:

- The 7501 CPU, which could be clocked up to 1.76 MHz and was 6502/6510 compatible.
- A new keyboard layout with 4 cursor keys in a diamond configuration.
- A charcoal gray case with white keys, gray function keys, and gray cursor keys.
- A sloping case that lost the bread box look of the VIC and 64.
- An enhanced BASIC, version 3.5.
- 64kB of RAM, of which 60671 bytes were available for BASIC.
- Support for multiple programming languages.
- Built-in 6551 hardware UART for telecommunications.
- 40 column by 25 line display via the Text Editing Device IC (TED).
- Ability to display 16 colors with 8 luminance levels each for a total of 121 different colors (all shades of black are black).
- Built-in machine language monitor (TEDMon).
- Support for parallel interface disk drive operation.

Magazines and other periodicals devoted much press to the Text Editing Device (TED) IC, which, like the VIC-I in the VIC-20, combined the graphics and sound into one chip. The TED could display 40x25 text and 320x200 graphics, yet had no support for hardware sprites. The TED also contained a 3 voice sound (2 sound generators and 1 noise generator). Some people referred to the 264 as the TED machine.

At the top end of the line, Commodore planned to introduce the V364, which shared the same case styling as the 264, but was wider to

Inside view of the 264



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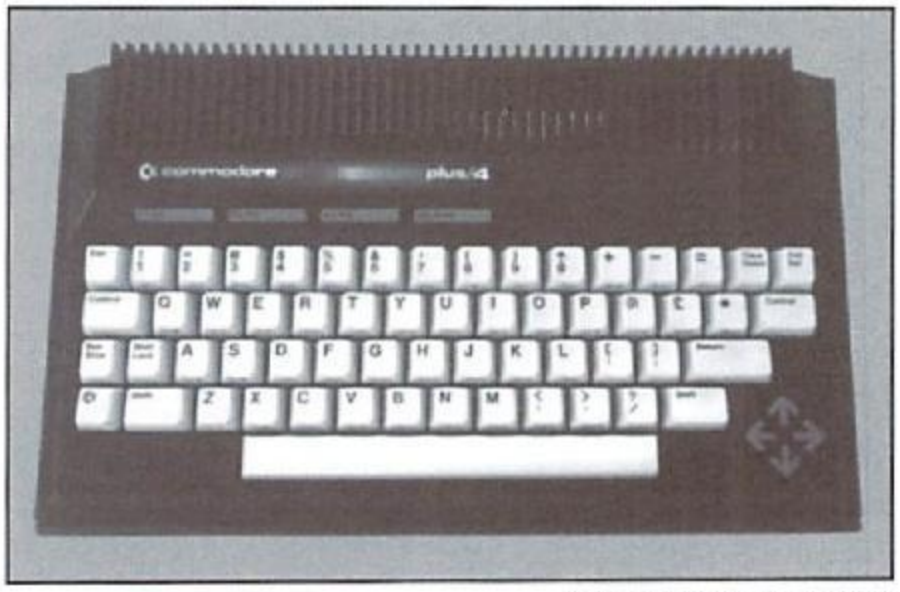
accommodate a numeric keypad. Internally, all 264 features were present, with the addition of a built-in speech synthesizer.

Before the machines were formally introduced, however, Commodore changed its plans. The V364 machine was dropped from the lineup, and the 264 was renamed the Plus/4 (or PLUS/4, as some references show the name as) and marketed as the top-tier machine. The newly renamed Plus/4 machine would be sold with four built-in productivity applications in ROM, called the 3+1 integrated software suite. With the Plus/4 moving up, two new machines were created to fill the resulting gap: the C16 and the C116. Borrowing from the successful VIC/C64 line, the Commodore 16 sported the same case and keyboard style of those earlier machines, although the key mapping had changed to reflect the need for 4 cursor keys. The C116, although functionally identical to the C16, was housed in a smaller version of the Plus/4 case and had a 'chicklet' keyboard. Although laid out like a QWERTY keyboard, the keys were reminiscent of calculator keys and the entire keyboard was much smaller than standard size. To reduce costs of these machine, the following features were either cut or changed from the original 264 (now Plus/4) specification:



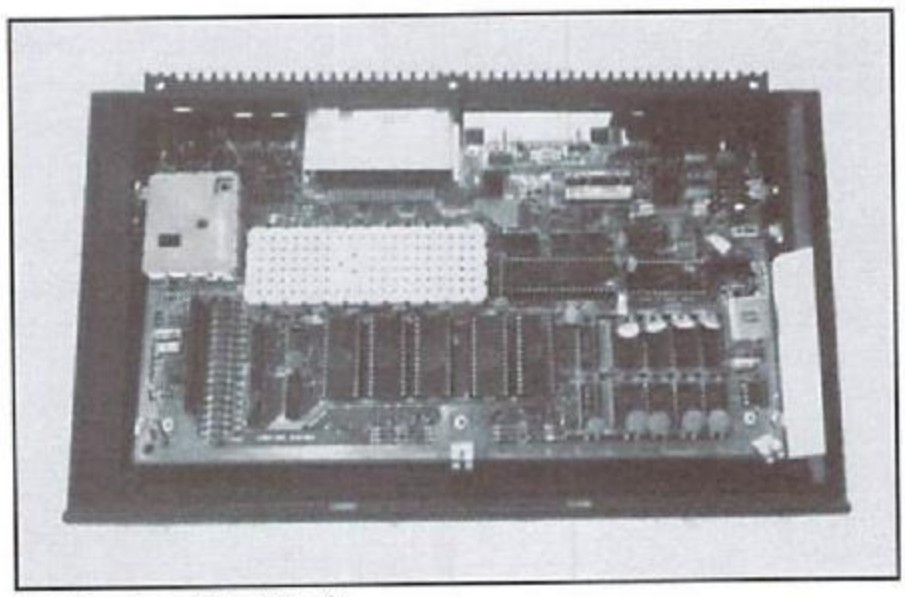
The Commodore Plus/4

- All keys were gray, except cursor keys on the C116, which were light gray.
- The machines contained only 16KB of RAM, of which only 12277 bytes were available for BASIC.
- Neither machine contained a user port.
- Neither machine contained a 6551 hardware UART or any support for telecommunications.
- The 3+1 software suite was not included, nor was the ability to use different programming languages.

Both The Plus/4 and C16 machines were previewed in the November 1984 issue of RUN Magazine.

The version of Commodore BASIC present on the 264 series was rather advanced, in spite of the badly chosen version number. Commodore numbered this version 3.5, even though the command set included all the commands found in Commodore BASIC 4.0 (found on later models of the PET/CBM business line) except the commands DOPEN, DCLOSE, and RECORD. In addition, this version of BASIC included a rich set of graphics and sound commands, previously found only in extensions to BASIC 2.0 and 4.0. Commands like RENUMBER, RESUME, TRAP, TRON, and TROFF helped make debugging BASIC programs a less tedious task. Some of these commands made their first appearance in the home computer market on the 264 series.

One main selling point of the new series was the integration of the productivity software into the computer system. The 3+1 software, a play on the name of Lotus 1-2-3, a popular software package at the time, was one of the first examples of integrated software on a computer system. Four applications were included, which included a word processor, a spreadsheet program, a graphics program, and data management software. Although rudimentary by todays standards, these programs were usable for light work. Available only on the Plus/4, this software suite was entered from the main screen by hitting the function key F1 and pressing the return key. Commodore played up the convenience of the built-in software and called the Plus/4 the Productivity Machine.



Inside view of the Plus/4

Not only did Commodore introduce built-in integrated software with the 264 series, but they also brought out a whole line of peripherals to support the machines. Among the introductions were: 2 disk drive models, a set of joysticks, a Datasette, and two printers. Each peripheral was charcoal gray to match the computers. Some peripherals, like the joysticks and Datasettes, were introduced simply because Commodore had changed these connectors on the 264 series, and older models would not work. Other peripherals, like the Commodore 1542 drive, were simply older units that were repainted to match the new color scheme. However, some peripherals, like the 1551 disk drive, were indeed designed with the 264 series in mind.

In the input device department, Commodore marketed a set of joysticks for the computers. These joysticks were simple pistol-grip models with the new connector.

If you have ever wondered why some models of the MPS 803 printer were charcoal gray in color, now you know. Functionally equivalent to the MPS 801 and 1525, this printer was the dot-matrix printer offered for use with the 264 series. For the business setting, Commodore produced the ill-fated DPS-1101 daisy-wheel letter quality printer. I say ill-fated because Commodore computer users have typically embraced graphics printers over text printers, and the DPS-1101 was merely the wrong kind.

The biggest news came in the storage device offerings. As earlier noted, the Datasette, model 1531, was simply a 1530 (or C2N) Datasette with a new connector. The first disk drive model, the 1542, was a similar mutation. Commodore simply dyed and renumbered a 1541 drive to create the 1542. However, Commodore did acknowledge the slowness of disk access on the 264 series by introducing the 1551 disk drive. The 1551, although containing the same mechanism as the 1541/42 (and able to read and write those models disks), featured a new and faster transfer method. The 1551, alternately called the SFS-481 drive, did not use the serial

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bus, like older drives. Instead, each drive came with a cable and interface that plugged into the expansion port. Two such 1551 drives could be connected in this way, and a cartridge could be plugged into the back of the interface. Instead of transferring bytes one bit at a time on the serial bus, the 1551 transferred 3 bits at a time on this 3 bit parallel bus (called the TED CBM or TCBM bus), which sped up the transfer rate to 1600 Bps (bytes per second) versus 300-400 Bps for the Commodore serial bus.

The Commodore C16

Commodore marketed the Modem/300 as the modem to use with the Plus/4 (the C16 had no user port). Most people know this modem as the 1660, which could be used on both the VIC-20 and C64 as well.

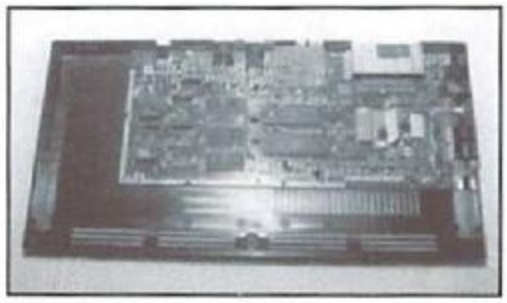
Along with the name change, the addition of the 3+1 software, the demise of the V364, and the introduction of the C16 and C116, Commodore changed the marketing plan. Commodore decided to market the series to both the business and educational markets, as well as individuals owning a VIC-20 or C64 that wanted more of a work computer. Alas, a number of technical and marketing problems plagued the 264 series.

The Commodore C116

At the time of introduction, the Commodore VIC-20 had sold millions of machines, and the Commodore 64 was selling at a similar rate. Users were accustomed to the feeble BASIC 2.0 and the ability to port programs between the two machines with little effort. With the radical changes in the memory map of the 264 series and the new version of BASIC, programmers found it harder to modify programs to work on the new machine.

There were more software woes. Commodore was slow in ramping up the development of in-house software for the new series. This fact, coupled with the lack of third party software because of code migration problems, presented the new Plus/4, C16, and C116 owner with few choices for software. Meanwhile, thousands of programs were already in production for the C64 and VIC-20.

At the time of introduction of the computers, a number of Commodore users were still using the Datasette as their primary storage device. For users wishing to use the Datasette on the new machines, the nonstandard connector on the new computers meant either buying a new Datasette or purchasing a special adapter for the existing unit. However, this was a small annoyance compared to the following problem. The tape formats on the new machines were incompatible with all other Commodore machines. Since the introduction of PET 2001, Commodore had maintained a single tape recording format on all its computers. Unintentionally or not, the 264 series routines transferred data to the Datasette half as fast. This make the Datasette unsuitable for transferring files and data between a Plus/4 or C16 and any other CBM machine, and the slower format made programs and data load at half the normal speed. This made an already slow storage medium more exasperating.



Internal view of the C16

On the marketing front, Commodore became a victim of their own success. With the C64 taking its place as one of the most economical computers and an established game machine, many saw Commodore as the producer of game oriented machines. Commodore's credibility as a business computer manufacturer was lost in the shuffle. As a result, few businesses gave the Plus/4 any serious consideration. Also, because of the success of the C64, most Commodore dealers and retail outlets were unwilling to devote much time and space to the new unproved machines. A large number of dealers refused to carry the alternate language ROMs, stating that swapping ROMs was too time and effort consuming.

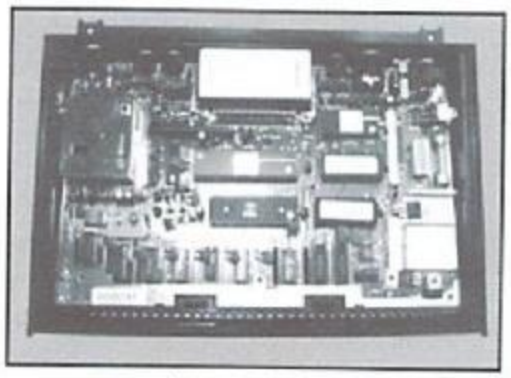
Buyers, expecting to purchase the newest "game" computer from Commodore, were disappointed when the new machine failed to provide the graphics and sound effects already present on the Commodore 64. Users were greatly disappointed by the lack of hardware sprites, a feature used by many C64 games that helped speed up game play. These things, coupled with the hardware incompatibilities and the lack of software, caused many to either not purchase or return the units.

Those buyers who did look at the machine in a business setting were equally disappointed. Although IBM compatibility was not the hot topic it is toady, the IBM PC and XT had started to appear in business settings. The IBM machine, as well as other business machines of the early to mid 1980s, had effectively standardized on a 80 column by 24 or 25 line display. The 264 series 40 column display just wasn't wide enough.

So, with all these problems working against the Commodore 264 series, production was short lived. During the late 1980s, the remaining stock was sold off to liquidators. Since there are actual 264 machines (labeled 264) on the market, it is believed Commodore erroneously liquidated the original prototype units as well.

Before you write off the Commodore 264 series as just a minor note in Commodore history, let me assure you that these computers and peripherals helped shape the direction of future Commodore systems. BASIC 3.5, with some changes, became Commodore BASIC 7.0, found in the C128 line. The 1551, though not a huge success in its own right, lent its DOS code to form the base for the 1571 and 1581 DOS versions. In these new products, the legacy of the 264 series proved more successful.

If you are the proud owner of any or all of the components in the 264 series, treasure your purchase. Even though this series never saw the financial success other Commodore systems enjoyed, they are by no means unsupported. Some magazines still cater to the Plus/4-C16 owners. They are, after all, Commodore machines, so most software can be modified to run on these machines. Some of the peripherals, like the printers, modems, and the monitors, can be used with other Commodore computer systems. So, the next time you encounter black Commodore computer or peripheral, welcome it, as it is no less important than the other orphan Commodore computers.



Internal view of the C116

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— From the Collector's Notebook —

Commodore 264 Series

• It is likely that a number of North American readers have seen a Plus/4, a C16, or a 1542 disk drive. However, considerably fewer people have seen a 1551 disk drive or a Commodore 116. Although it isn't verified, these components are believed to have been available only in Europe and Japan.

• The earliest flyer in my collection lists the Plus/4 for under $300.

• The power supply used on the Plus/4 machine was simply a VIC/64 brick power supply with a special connector. The 264 used a standard VIC/64 power supply.

• The C16 and C116 use a 9v DC power supply with a small coax connector.

• The 1551 disk drive will power up with a 73 CBM DOS V2.6 1DISK,0,0 error status. The version number is misleading though, since this version 2.6 contained extra commands not found in the 1541 drives DOS.

• Even though the C16 case looks strikingly similar to the VIC and C64 case, it is slightly shorter in height, and some I/O ports in back have been reshaped for the new connectors.

• Although impossible to prove, it is believed Commodore changed the connectors on the joystick and cassette ports to speed up FCC acceptance. The new connectors were of the European mini-DIN variety, which allow less RF radiation leakage.

• It is generally believed that the V364 never made it past the mock-up stage. I have seen no mention of anyone owning such a machine. Conflicting reports state the speech synthesizer, which was to be included in the V364, to be software based and hardware based. Given the embryonic stage of the design I am not sure even Commodore knew.

• Photos of the 1551 drive show it both with an old style latching mechanism installed and with the new style Turn down latching mechanism installed. It is not known whether both versions were actually sold.

• Some contacts report that the C16 is alternately called the TED-16, since the VIC IC was used in the VIC-20, although the VIC chip stand for Video Interface Chip, and the computer is the Video Interface Computer-20.

• For those who own a Plus/4, C16, or C116 and want to make more use of the machine, I would suggest contacting Jack VanderWhite. Jack offers many software titles for the 264 series and publishes a disk magazine with Plus/4 and C16 information in it called COMMODORE CEE. Special thanks to Jack for verifying some of the information in this article.

COMMODORE CEE
c/o Jack VanderWhite
P.O. Box 23215
Sacramento, CA 95823

Internet:
Jack_VanderWhite.cee-64.wmenlo.sadolbox.com
FidoNet:1:203/999
BBS: (916) 395-9733

Differences between the 264 and the Plus/4:

• The power supply connector on the 264 is identical to the 5 pin DIN connector used on the later VIC-20s and C64s. The production P4 uses a 4 pin square connector similar to the 5 pin connector used on the C128.

• The 264 prototype typically does not include the 3+1 ROMs.

• Some small IC components on the motherboard are either hardwired or some hand wired jumpers are installed. (In these pictures, the 264 prototype has the 6529 PIO for the keyboard hand wired in.)

Differences between the C16 and the C116:

• Although functionally equivalent, the motherboards for the two machines are completely different.

• The C16 uses a typewriter keyboard, while the C116 employs a chicklet keyboard.

• The C116 case is styled to look like a smaller version of the Plus/4, while the C16 uses the traditional VIC/64 case and keyboard.

Main ICs:	Part Number	Description
CPU:	7501 or 8501	Derivative of 6502/6510 CPU core.
TED:	8360	Text Editing Device (Graphics and Sound).
UART:	8551	Telecommunications.
PIO:	6529	Handles I/O, keyboard, etc.

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Graphic Interpretation

by Steve Vander Ark

SOME TIPS ON USING GEOPUBLISH

There are few programs that I enjoy using more than geoPublish. I suppose the fact that I get a kick out of desktop publishing is one reason, but the real reason runs deeper than that. The real reason I love geoPublish is that there really is no program that better shows off the potential of the Commodore computer and the genius of the GEOS operating system.

GEOS was conceived by some very talented programmers at a company called Berkeley Softworks well over ten years ago, back when the whole idea of a graphical interface was new and innovative. Back then, the Macintosh was demonstrating that you didn't have to learn to program just to format a disk as long as you could point and click with a mouse. Quite a few die-hard computer people thumbed their noses at the whole thing (as some still do); but more and more folks came to find that operating a computer wasn't as difficult as it seemed once they had menus of choices ready for them to pull down when they needed them, and cute little icons that stood for their favorite programs. This was when Brian Dougherty proposed an exciting idea to one of the leading computer manufacturers in the US, that his company create such a graphical interface for their number one selling model, the Commodore 64. They turned him down.

Dougherty and his company, Berkeley Softworks, turned their attention toward other projects to pay the bills, but a few years later when the concept of a graphical interface was clearly here to stay, Dougherty finally got his chance. GEOS was born. At first it was, not all that successful. The first versions of GEOS were buggy and lacking in features. But as the product matured, and as die-hard fans like Peter and Paul Hughes promoted it to user groups all over the country, GEOS took its place as the "official" disk-based operating system for the Commodore.

More and more people got excited about GEOS, and by the time it reached version 2.0 GEOS had expanded into a whole family of powerful productivity applications for the Commodore. The basic GEOS operating system was distributed in a package deal with the Commodore disk drive, and soon practically everyone had at least tried it. User groups continued to promote and support GEOS and related products. Magazines like *RUN* and *Compute's Gazette* devoted vast amounts of space to articles and columns about them. Third party GEOS products appeared, including some truly spectacular shareware titles. Much of the fancier hardware created for the Commodore, from the mouse to the RAMLink, was at least in part designed with GEOS in mind. And while there are still plenty of Commodore users who think GEOS is for computer sissies, an awful lot of folks find that GEOS offers an unprecedented level of power and convenience on a relatively low-powered machine. And the star of the whole GEOS family is geoPublish.

You get a taste of the potential that still exists in the Commodore computer when you see a document slide out of a laser printer and realize that it is as sharp and as professional-looking as the same page coming from, say, a Macintosh. Even with a dot matrix printer using one of the latest printer drivers, the results are excellent. Not only is the final product a delight, but the many exciting features of the program also make desktop publishing itself a lot of fun.

If you've read many of my columns over the years, you've heard me heap praises on the designers of GEOS. When you note that the geoPublish program itself is almost 100K, you can see why I say that over and over. Think about it: your Commodore 64 only has about 37K of working space available, yet geoPublish is a 100K program. That looks almost like magic and in a sense, it is. In this case, the magic is that GEOS uses the disk drive as almost an extension of RAM, swapping sections of the geoPublish program in and out when called for. The same is true of the document geoPublish creates. Most of it is stored on the disk drive even when it's open and being worked on. The result is a program unfettered by the limitations of the Commodore computer's limited memory. Unfortunately, without a RAM device to act as a very fast disk drive, the result is also a program which often crawls along at a snail's pace.

It's not all that hard to overcome those limitations, of course. There are a number of excellent RAM devices available which speed things up considerably; I can hardly imagine running GEOS (and especially geoPublish) without one. But there are other limitations which are worth noting as well, and in this column I'll run through some of them. I'll try to offer viable ways of overcoming those limitations also.

I don't intend to offer a "how to desktop publish" article here; there have been plenty of them published over the years, including an excellent one by Don Radler in issue 6 of this

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magazine. But one point bears discussion in the context of limitations and that is the importance of planning ahead. You see, one seductive feature of any desktop publishing program is the ease with which you can create a document right there on the screen. I suppose that isn't really a limitation, but many users make it into one. It's so easy to just wing it, placing graphics and text wherever they look good as you work, and a lot of people mistake that interactive process for good desktop publishing. The trouble is, projects done with no advance planning look shoddy and amateurish. You want examples? Go check the bulletin board at the local supermarket. Just because a computer program gives you the power to make the whole thing up as you go along doesn't mean that you should. That's when the power becomes a limitation. GeoPublish is no exception. If you let the interactive nature of the program's tools and features make your decisions for you, you won't be very successful. But with a little planning, you can be in control of your own work; the power features will work for you.

Here are some practical ways to make this happen. First of all, let the program's built-in limit on fonts force you to choose your fonts ahead of time. Ideally, any desktop published page should include only two or three fonts anyway: one for headlines and larger text, one for the main body of the text, and maybe one for emphasis or decoration. I suppose some people might accuse me of trying to turn a flaw—the seven-font limit—into a feature, but in a very real sense it is just that. Probably the most obvious sign of shoddy desktop publishing is way too many fonts on a page.

Second, use the full page mode more than the zoom mode. There's a very important reason why this is so. If you're doing your job properly, you see, you should sketch out your pages ahead of time. I always do, even if it's just for a quick worksheet for my third graders. This lets me get the overall balance of the page correct, with larger graphic objects and a sense of coherent design. Once I have that general plan in mind, the full-page mode of geoPublish lets me go right ahead and transfer that layout to my page. Once I have placed everything, I'll zoom in and fine tune the looks and the placement of the various elements; but even then I use the full-page mode to keep the whole business in perspective. This concept is critical; it's the main reason why programs like geoPaint and even Fun Graphics Machine don't work as well for real desktop publishing projects. Without that full-page view, the page tends to consist of a lot of small sections, way too much text, and no overall sense of balance or design. Now granted, with some careful planning, either of those programs can do a fine job of creating a page. Even so, they can't really let you create full-page graphic objects without some pretty convoluted tricks, and they require you to be able to keep things balanced in your imagination instead of on a page you can see and work with. Remember that when someone looks at your published page, they see it as a full page first. Balance, especially of text and white space, is crucial. GeoPublish gives you the power to keep that balance.

Third, use geoPublish graphics for design elements on your page. I'm talking about graphic objects created using the various tools of geoPublish itself. Anyone who moves to geoPublish from programs like geoPaint wonders where the pixel-by-pixel edit mode went. The fact of the matter is, geoPublish doesn't have that kind of editing, and the reason is that its graphics aren't put together that way. Now you can easily import those kind of graphics into geoPublish, and I don't mean to downplay the effectiveness of the perfect bit-mapped graphic image on a page. But for design elements on a page, the graphics geoPublish creates are much more versatile. These graphics are called "objects," which refers to the fact that they are independently-defined entities within the computer's memory. They exist as separate shapes, even if layered into more complex patterns and designs. Not only that, but these shapes aren't defined as a series of dots on the screen, but rather as a mathematical equation. What that means is that when these objects are displayed on the screen or printed out on a printer, they are given their dot patterns to the best of the ability of the screen or the printer to reproduce that equation. This makes a geoPublish graphic object resizable to any dimensions with no loss of smoothness. Try enlarging a bitmapped graphic (which is defined as a series of set points) and you'll see how jagged they get. Your design elements will always look their best if you create them with geoPublish tools. By that same token, if you use bitmapped graphics, don't attempt to resize them. They'll never look the same again and will probably look a whole lot worse.

> "CONSIDER THIS BASIC APPROACH TO ANY GEOPUBLISH PROJECT; PLAN YOUR PAGES AHEAD OF TIME."

Don't interpret this to mean that there is no place for bitmapped images in geoPublish documents. GeoPublish's graphic objects will never have the same richness of detail that you'll get with a first-rate bitmap. I have a great selection of clip art in bitmap format which I use all the time. The trick is to find an object that fits the bill which also fits the page. Since resizing is pretty much out of the question, I have to create my whole page around the dimensions of a bitmap I really want to use. That gets us right back to planning ahead, and with bitmaps and geoPublish, this is essential. While the limitation on fonts is built right into the GEOS system itself, the limitation on bitmaps is more basic. They're huge. An image large enough to do justice to a full-page layout will eat up an awful lot of disk space. It's just not convenient to keep a large selection of those images on a disk along with all the other files you'll want handy, particularly geoPublish, which is pretty big all by itself. Even if you have a RAMLink with a generous helping of RAM, any good sized collection of decent images will need to be stored elsewhere. I keep mine on a series of disks in photo albums. Some of the very large images I keep as geoPaint documents. In order to use them in geoPublish, I need to pick out the images I'm likely to need before I get started. That means, you guessed it, planning ahead.

With all those things in mind, consider this basic approach to any geoPublish project; plan your pages ahead of time, listing those few fonts you'll use throughout. Sketch the basic layout of each page, indicating where the text will go while leaving enough white space to keep things readable and the design balanced. If you're going to use geoWrite text files, create them and store them along with everything else on your RAM device or work disk. Select the bitmaps you will want to use and create a photo album of them. You can keep this photo album on its own disk if you are pressed for space, then use Scrap Grab instead of the Photo Manager to get them when you need them. (Scrap Grab lets you search other disk drives for images.) Once you have done this advance planning, you're ready to go. While you're working, keep the big picture in mind. Don't let yourself get caught up in small sections of your page, and keep changes to a minimum. Any changes you do make to your advance plans should be carefully considered, not just tossed in. Use the geoPublish graphics tools to create a few design elements such as lines or boxes. Once you're done, use the best printer drivers you can find for your printer. When you do your part and plan this way, geoPublish will deliver a printed page that will impress everyone who sees it. They'll be twice as impressed when you say, "I did that with my Commodore!"

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GEO PROGRAMIST

by Maurice Randall

UNDERSTANDING THE LAYOUT

I remember several years ago, I was thinking about trying my hand at programming in GEOS, but I kept avoiding it because I didn't understand how the system operated underneath.

From the user's point of view, I saw GEOS as being a very interesting system, unlike anything ever before for the Commodore computer. I thought it must be a very complex system to learn to program for. Boy was I wrong. I soon discovered that it was, in fact, easier to create elaborate, professional looking programs for GEOS, than to do the same thing outside of GEOS. The majority of the tools needed were already provided for me. All I had to do was use my creative mind to manipulate those tools.

The GEOS Kernal contains a wealth of routines that are just begging to be used. Once I learned how it was all laid out, it seemed so easy. That is the hardest part for any programmer new to GEOS, getting to know the system and writing software to interact with the system in the way it was meant to be.

You don't need to know everything about the GEOS Kernal to make good use of it, but it is most helpful to have a good basic understanding of how the system works and how it is laid out. You need to know what configuration the machine is in when you are accessing certain Kernal routines. There are also ways to access the standard Commodore Kernal routines. Let's see if we can learn just how the 64 and 128 is set up under GEOS and how they might differ.

The GEOS Kernal resides in an area of memory on the 64 and is always available for access while your application is running. The Kernal can be found in the area from $C000-$FFFF. The area from $8000-9FFF is also used by the Kernal. There are system variables and various work areas, plus the disk driver in this area. The graphics screen that the user sees is always at $A000-$BF3F. There are other system variables in use below $0400. From $0400 on up to $7FFF is pure programming space for you to use as you need, unless you need to make use of a background screen or a printer driver. The printer driver occupies the space at $7900-$7F3F and the background screen at $6000-$7F3F. Whoa... make notice of that little overlap there and don't forget about that one when you need to use both. It caught me at one time until I realized it. You can't use the background screen (in its entirety) and a printer driver at the same time.

The 128 Can Get You

Now let's take a look at what is commonly known as the I/O area. This is the area from $D000-$DFFF. There is a difference between the 64 and 128 here. The difference is that on the 64 the I/O area is not visible, while on the 128 it is. On a 128, if you poke a value within this area, it will do what you intend. But on a 64 you will instead corrupt the area of ram that resides there. Outside of GEOS, this area of ram is normally hidden underneath the I/O area, but in GEOS it is visible, but only on the 64. Calling the Kernal routine known as InitForIO will make the I/O area available on the 64. It will also make it available on the 128, although it is not needed since it is already available. When you are finished using the I/O area, you simply call DoneWithIO.

What else happens to the state of the machine when you call InitForIO? You not only have access to the I/O area, but you also gain access to the standard Commodore Kernal. The GEOS Kernal gets switched out and the Commodore Kernal gets switched in. Well, almost. Here comes that 128 again... On the 128, the GEOS Kernal never gets switched out when you call InitForIO and the Commodore Kernal likewise does not get switched in. This will mess you up every time. I know from experience. Let's see what really happens.

When InitForIO is called, some routine stuff gets taken care of. Sprites get disabled for one thing. The interrupt vectors that point the processor into specific GEOS routines get changed. They will now point to a 'do nothing' routine. Your application is in control at this point. You now have the opportunity to do special things that maybe GEOS can't deal with, but we will get into things of that nature at another time.

You can do stuff like jump straight into the Commodore Kernal now. Whoops, I forgot about the 128. See, it will get you if you don't think about it. The only part of the Commodore Kernal that you get access to on the 128 is the Kernal jump table... and it is actually a copy of the jump table that points you right back into some GEOS Kernal routines. Those routines will then switch out GEOS and jump into the Commodore Kernal routine you intended and when finished, GEOS will be switched back in. This is the biggest difference between the 64 and 128 and you have to remember this if you do anything strange with the computer in your programming.

Why are the sprites turned off when you call InitForIO? The top-level disk driver routines call InitForIO before calling the lower-level routines. This was the original purpose of InitForIO... to prepare the machine for disk access. The disk driver gets complete control of the machine when communicating with the drive, nothing else gets to happen except for the little screen refreshing that the VIC-II chip does. The disk drivers deal with that as each byte is transferred. You don't have to worry about that unless you want to write a disk driver.

So, what if I want to have sprites in my program, but I don't want to disable them to do something that I need the Commodore Kernal for. The answer to that is simple... just don't call InitForIO. On the 128, go ahead and call the kernal routine that you need. GEOS will take care of it for you without turning off the sprites, just be careful to not use a disk access routine. On the 64, though, you will need to disable the interrupts with a SEI instruction and then do the memory configuration handling yourself.

Even if you are not using sprites, you are still using them. Yes, don't forget the mouse pointer, it is a sprite, except in the 128's 80 column mode. Don't worry about it though, by disabling the interrupts, there will be no conflict, the mouse routines won't get accessed.

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Know Your Machine

Are you seeing the importance of knowing what machine your application is running on? A few issues ago, I talked about establishing a variable called screenMode. But I only talked about setting or clearing bit 7 to distinguish whether we are running in 40 columns or 80 columns. Now we need to expand on that further to include a 64 or 128 recognition in there. Let's use bit 6 for this. That's an easy one to remember because if bit 6 is set, the byte equals decimal 64. So if we have determined at the start of our application that the machine is a 64, simply set bit 6 of screenMode. If the machine is a 128 running in 80 column mode, set bit 7. What is the hex byte if bit 7 is set? It is $80, and it is also a decimal 128. Simple to remember. If the machine is a 128 running in 40 column mode, just set screenMode to zero. Sorry, I don't know the significance of that one!

Now let's talk about the I/O area again. What if you only need to do something real quick in the I/O area. You can go ahead and call InitForIO, do your thing and then call DoneWithIO. But maybe your application needs the most speed it can get and maybe you only need to change one byte, something real quick, like maybe the background color or a value in the SID chip or something. Calling the InitForIO-DoneWithIO sequence is slow. In addition to some routine stuff that we already talked about, there is also a short delay of about .003 seconds built into it in addition to the rest of the routines. That doesn't sound like much, but if you have to get in and out of the I/O area 1000 times, you are going to eat up 3 or 4 seconds doing it. That makes for a slow program and we don't want that. If you only need a few quick accesses, then InitForIO is fine. Let's see how this can be done without using InitForIO.

When you have a routine that needs to access the I/O area just add a little bit of code to the start and end of the routine as follows:

```
  php
  sei
  bit screenMode
  bvc 10$
  PushB CPU_DATA
  LoadB CPU_DATA,#IO_IN
10$
  ...
  your routine goes here
  ...
  bit screenMode
  bvc 80$
  PopB CPU_DATA
80$
  plp
  rts
```

The code at the start of this routine can take the place of InitForIO and the code at the end can replace DoneWithIO. If the machine is a 64, this code takes care of switching out the GEOS Kernal. If it is a 128, nothing is done because the I/O area is available anyway, but interrupts are still disabled. This is much faster than using InitForIO. If you need disk access, you can't do this but just about anything else can be done in the I/O area this way.

Something else you need to be aware of is that some of the GEOS Kernal routines specifically require that InitForIO is called before you access them and there are others that require that InitForIO has not been called. Some routines don't care either way. If you goof on this, you are sure to crash the machine. In the next issue, I'll deal with that subject. We will also take a look at what it takes to get the 128 into a state where we have the GEOS Kernal completely switched out and the Commodore Kernal uncovered.

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BASIC INSTINCTS

by Gene Barker

USING BASIC'S LOAD: PART 1

In this two part series we'll focus on BASIC's powerful LOAD statement and its use in our programs. This first installment focuses on using LOAD to divide programs into modules, thereby creating a 'virtual' memory capacity for our programs. The techniques shown here can also be used to create convenient loader programs to load other BASIC programs.

The LOAD Command

```
LOAD"*",8
```

We've all seen this command before. It loads the last program that was accessed by device number eight. If no previous programs were accessed, this command loads the first program located in the directory. If we wanted to make absolutely sure that we always loaded the first program on the disk, we would instead type:

```
LOAD"Ø:*",8
```

The zero in the above statement is a - from Commodore's disk units which had two drives. The zero indicates drive 0 (the first drive), and a one in this location would indicate drive 1 (the second drive). Many single drives still make use of this zero despite the fact that they don't have a second drive, and it's wise to use it in your disk commands to be safe. The colon indicates that the drive should begin its search at the top of the directory. And the asterisk indicates that the filename could be anything.

We've all used the LOAD command before, but how many of us have used it in our programs?

How It Works

Take a look at the following two small BASIC programs:

Program One

```
1ØØ REM PROGRAM ONE
1Ø5 A=999
11Ø LOAD"PROGRAM TWO",8
115 PRINT"DONE!"
```

Program Two

```
1ØØ REM PROGRAM TWO
1Ø5 PRINT"A ="A
```

What happens if you RUN Program One? It appears like the program would load Program Two from device 8 then print "DONE!" But it doesn't. Program One never gets to line 115. It loads Program Two and runs it, which results in the following output:

```
A = 999
```

Whenever you use the LOAD statement in a program, it loads the requested file and automatically runs it. It's as if we executed the following lines:

```
LOAD"PROGRAM TWO",8
RUN
```

The original program is overwritten and lost. There is one beneficial difference to loading a program from another, however: the new program retains all of the variable values used in the previous program (provided the new program is at least one block smaller than the *first* program loaded). For example, the variable 'A' which was set in line 105 of the calling program would still be equal to 999, whereas 'A' would be set to zero if we had just loaded Program Two using direct mode.

This Issue's Example Programs

This issue has four separate example programs:

(1) MENU.BAS - BASIC menu program for selecting which program you want to use.

(2) RANCHAR.BAS - BASIC program that POKEs random characters with random colors to the screen.

(3) RANSCREEN.BAS - BASIC program that changes the border and screen areas to random colors.

(4) DEFAULT.BAS - BASIC program that lets you change the default border, screen and text colors used by the menu program MENU.BAS.

MENU.BAS is the core of these programs. It acts as a main menu, managing the use of the other three programs. Notice that the first executable line of MENU.BAS line 155, checks if the load flag LF equals 999. If not, the program knows that this is the first time that MENU.BAS has ever run. So the program in lines 160 to 205 saves the current border, screen and text colors, as well as the current drive number. After it saves these values, it sets the load flag LF equal to 999. Now the next time we enter this program from another program, MENU.BAS knows these values and can reset them should another program change them. These resets are performed in lines

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250 to 275. Lines 300 to 440 let you select which program you want to use.

RANCHAR.BAS uses some of the screen I/O techniques we mentioned in the last issue. The key to this program are the following two lines:

```
215 POKE 1024+A,B
220 POKE 55296+A,C
```

1024 represents the start of screen memory and 55296 the start of color memory. Since your Commodore has (25) lines which are (40) characters wide, there are (25 * 40) or (1000) possible screen positions. So RANCHAR.BAS generates a random number between (0) and (999), then adds it to both the screen and color memory positions. In line 215, RANCHAR.BAS pokes a random character B (a screen character code between 0 and 255) to a random position on the screen (1024+A). In line 220, RANCHAR.BAS pokes a random screen color C (screen color code between 0 and 15) to the same random screen position as line 215 (55296+A). This has the effect of poking a random character with a random color to a random position on the screen.

RANSCREEN.BAS will randomly change the border and screen colors continuously. The key to this program are the following two lines:

```
135 POKE 53280,A
140 POKE 53281,B
```

53280 is the location in memory which represents the current border color and 53281 is the location which represents the current screen color. By poking a screen color code (between 0 and 15) to one of these locations you instantly change the color of the border or screen.

DEFAULT.BAS allows the user to change the default color scheme used by the menu program. This program shows how programs loaded from other programs such as MENU.BAS retain the calling program's variables. In DEFAULT.BAS we change the variables MENU.BAS uses to set its colors.

BC - Border Color (0-15)
SC - Screen Color (0-15)
TC - Text Color (0-15)

Notes

As you type in this issue's program, take it one section at a time. Try to get a general idea of what the section is trying to accomplish. Pay close attention to how the variables from the previously loaded program are retained and used in the currently loaded program. If you see an unfamiliar BASIC statement, take a quick look at it in your BASIC manual. If you are still confused, move on to the next section; often times the next section helps explain the previous one. Above all, don't forget to BACKUP your work frequently.

Entering The Programs

Before entering this issue's programs, load and run the CHK-LIST utility (located elsewhere in this issue). CHK-LIST ensures that you enter the programs correctly. Also, remember to SAVE each program before you attempt to RUN it. It never hurts to be safe. And finally, make sure you use the correct filename for each program.

(Program listings are located on the following page)

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BASIC INSTINCTS SAMPLE PROGRAMS

MENU.BAS

```
5000 100 rem--------------------------------
6dc2 105 rem commodore world magazine
c67c 110 rem basic instincts w/gene barker
b052 115 rem using basic's load part i
0e6b 120 rem
2d24 125 rem (c)1995 creative micro designs
92ad 130 rem--------------------------------
1315 135 rem-
13f6 140 rem check if we have been here
afac 145 rem before
7e06 150 rem-
62fc 155 if lf=999 then 250
af50 160 rem-
c62e 165 rem store away orginal colors and
492d 170 rem drive number
1315 175 rem-
6204 180 bc=peek(53280):rem border color
77e5 185 sc=peek(53281):rem screen color
3509 190 tc=peek(646):  rem text color
7d0b 195 dv=peek(186):  rem curr drive #
2aef 200 lf=999:        rem set load flag
6b0b 205 goto 300
da6b 250 rem-
ac0a 255 rem restore original colors
5291 260 rem-
fb5a 265 poke 53280,bc
b30d 270 poke 53281,sc
638b 275 poke 646,tc
5291 300 rem-
ae8d 305 rem let user choose which program
2597 310 rem he/she wishes to use
f573 315 rem-
232e 320 print"{CLEAR/HOME}{CRSR DN}{CRSR RT}
     main menu:"
567a 325 print"{CRSR DN}{CRSR RT}(1) random s
     creen characters"
0db7 330 print"{CRSR RT}(2) random screen col
     ors"
3cf0 335 print"{CRSR RT}(3) change default co
     lors"
16d7 340 print"{CRSR RT}(4) quit program"
460b 345 print"{CRSR DN}{CRSR RT}choose an op
     tion (1-4)"
b0ec 400 get x$:if x$="" then 400
c8e1 405 if x$<>"1" then 415
2093 410 : load"ranchar.bas",dv
bc03 415 if x$<>"2" then 425
e20e 420 : load"ranscreen.bas",dv
9568 425 if x$<>"3" then 435
63d4 430 : load"default.bas",dv
a043 435 if x$<>"4" then 400
318d 440 : end
```

RANCHAR.BAS

```
5000 100 rem--------------------------------
bb8c 105 rem random char sample program
5000 110 rem--------------------------------
6f50 115 poke53280,0
3725 120 poke53281,0
699d 125 print chr$(147)
aeb8 200 a=int(1000*rnd(1))
8154 205 b=int(256*rnd(1))
4395 210 c=int(16*rnd(1))
c60e 215 poke 1024+a,b
9f7d 220 poke 55296+a,c
51be 225 get x$:if x$="" then 200
4e79 230 load"menu.bas",dv
```

RANCHAR.BAS

```
5000 100 rem--------------------------------
fd7f 105 rem random screen color sample
60e9 110 rem program
a856 115 rem--------------------------------
abed 120 print chr$(147)
c551 125 a=int(16*rnd(1))
ada8 130 b=int(16*rnd(1))
747b 135 poke 53280,a
8b23 140 poke 53281,b
e015 145 get x$:if x$="" then 125
e15b 150 load"menu.bas",dv
```

RANCHAR.BAS

```
5000 100 rem--------------------------------
4367 105 rem change defaults sample program
5000 110 rem--------------------------------
4e82 115 a=bc:b=sc:c=tc
ec9d 120 poke 53280,a
4282 125 poke 53281,b
1954 130 poke 646,c
12c9 135 print"{CLEAR/HOME}{CRSR DN}{CRSR RT}
     change default colors:"
cc07 140 print"{CRSR DN}{CRSR RT}{f1} change
     border color"
5e49 145 print"{CRSR RT}{f3} change screen co
     lor"
c88e 150 print"{CRSR RT}{f5} change text colo
     r"
371b 155 print"{CRSR DN}{CRSR RT}press [retur
     n] to keep new colors"
cd60 160 print"{CRSR RT}press (_) to use old
     colors"
640d 200 get x$:if x$="" then 200
b87c 205 if x$<>"{F1}" then 230
b34f 210 : a=a+1
2d48 215 : if a<16 then 120
1557 220 :   a=a-16
5486 225 :   goto 215
732c 230 if x$<>"{F3}" then 255
96f3 235 : b=b+1
6afb 240 : if b<16 then 120
2536 245 :   b=b-16
76a2 250 :   goto 240
954c 255 if x$<>"{F5}" then 280
6454 260 : c=c+1
ac44 265 : if c<16 then 120
270e 270 :   c=c-16
d5de 275 :   goto 265
8bb8 280 if x$<>chr$(13) then 295
0b20 285 : bc=a:sc=b:tc=c
716b 290 : load"menu.bas",dv
9009 295 if x$<>"_" then 200
81cc 300 : load"menu.bas",dv
```

REMEMBER...
ALWAYS SAVE
YOUR WORK BEFORE
TRYING IT OUT...
JUST IN CASE!

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How to Type In Program Listings Appearing in Commodore World

While *Commodore World* currently doesn't make it a habit of publishing type-in programs, a number of our columns do require entering sample routines. For this purpose, we have created our CHK-LIST utility for the Commodore 64 and 128. This utility uses a 16-bit CRC checksum method to verify that you have correctly entered each program line, and that each of the characters in the program lines are in the correct order.

You'll notice that program listings appear with a column of values to the left of the program lines. These values are the CHK-LIST values and are not to be entered as part of the program. A similar set of values are generated by the CHK-LIST utility to allow you to verify that everything has been entered correctly.

Enter the CHK-LIST program from BASIC. You can use either a C-64 or a C-128 computer. If you use a C-128, it can be in either 64 or 128 mode. Be sure to enter each line carefully to avoid mistakes—until you actually have CHK-LIST working, finding errors in program entry won't be easy. After you have finished entering the program, be sure to SAVE a copy to disk before you attempt to RUN it, just in case. If you aren't familiar with how to save a program to disk, you can use the following command:

```
SAVE"CHK-LIST",8
```

To use CHK-LIST, load it into your computer and type RUN. Make sure that any program you are currently working on is saved first, or start CHK-LIST before you begin typing in a new program. After you have CHK-LIST in memory and running, type NEW. You may now either load or begin typing the program you wish to have CHK-LIST check on. Whenever you want to check your program, type in the appropriate SYS command given below:

C-64 or C-128 in 64 mode:	`SYS49152`
C-128 in 128 mode:	`SYS4864`

Note that when typing in listings, some special characters will appear in braces. For example, {CLR/HOME} means that you should enter the Clear key, which is done by holding down the SHIFT key while you press the HOME key. Other times you may see a number ahead of the key name, such as {3 SPACES} or {5 CRSR L}. This means you should press the key indicated the number of times shown. Most special keys are easy to identify, since the text shown will generally match the text on the key. Exceptions are the space bar {SPACE}, and cursor keys which include directions ({CRSR UP}, {CRSR DN}, {CRSR L} and {CRSR RT}). Be sure to use the correct key combinations for color keys, such as <CTRL><2> for {WHT}.

CHK-LIST

```
A454 10 F=ABS(PEEK(65533)=255):M=49152:IFFTHE
     NM=4864
6E2F 12 C=Ø:PRINT"{CLR/HOME}WORKING";
E35Ø 2Ø READD:IFD=-256THEN4Ø
AD2Ø 3Ø C=C+D:IFD<ØANDF=ØTHEN2Ø
3316 31 IFD<ØTHEND=Ø-D:M=M-1
Ø7FØ 32 POKEM,D:M=M+1:PRINT".";:GOTO2Ø
578A 4Ø PRINT:READCK:IFC<>CKTHENPRINT"ERROR I
     N DATA STATEMENTS!":END
Ø679 5Ø PRINT"DONE.":END
8D92 6Ø :
E7FE 49152 DATA 165,43,-45,133,251,165,44,-46
     ,133,252
B2AE 4916Ø DATA 169,Ø,141,36,193,-2Ø,169,147,
     32
CD5Ø 49168 DATA 21Ø,255,32,194,192,-19,16Ø,Ø,
     14Ø
C9CD 49176 DATA 37,193,-2Ø,177,251,133,253,2Ø
     8,3
2Ø58 49184 DATA 238,37,193,-2Ø,2ØØ,177,251,13
     3,254
EA9C 49192 DATA 2Ø8,3,238,37,193,-2Ø,173,37,1
     93,-2Ø
6C15 49200 DATA 2Ø1,2,2Ø8,1,96,2ØØ,177,251
E7ØE 49208 DATA 17Ø,2ØØ,177,251,32,2Ø5,-5Ø,18
     9,-142,169
6795 49216 DATA 6,133,211,-236,169,61,32,21Ø,
     255
F8ØF 49224 DATA 169,32,32,21Ø,255,16Ø,2,177
9735 49232 DATA 251,32,213,192,-19,2ØØ,177,25
     1,32
Ø734 49240 DATA 213,192,-19,2ØØ,177,251,24Ø,6
     ,32
D99D 49248 DATA 213,192,-19,76,9Ø,192,-19,173
     ,191,192,-19
AC3Ø 49256 DATA 32,167,192,-19,173,19Ø,192,-1
     9,32,167
```

CHK-LIST *(cont.)*

```
B343 49264 DATA 192,-19,169,13,32,21Ø,255,165
     ,253
DF3A 49272 DATA 133,251,165,254,133,252,238,3
     6
A6E2 49280 DATA 193,-2Ø,173,36,193,-2Ø,2Ø1,2Ø
     ,24Ø,3
936E 49288 DATA 76,18,192,-19,162,Ø,189,1,193
     ,-2Ø
8C3A 49296 DATA 24Ø,6,32,21Ø,255,232,2Ø8,245,
     32
EB74 49304 DATA 228,255,2Ø1,13,2Ø8,249,32
6Ø95 49312 DATA 228,255,2Ø8,251,76,8,192,-19,
     72
AØØ1 49320 DATA 1Ø6,1Ø6,1Ø6,1Ø6,32,18Ø,192,-1
     9,1Ø4
FAA2 49328 DATA 32,18Ø,192,-19,96,41,15,17Ø,1
     89
EBFD 49336 DATA 2Ø,193,-2Ø,32,21Ø,255,96,Ø,Ø
E9Ø7 49344 DATA Ø,Ø,169,Ø,141,19Ø,192,-19,141
E8EA 49352 DATA 191,192,-19,169,33,141,192,19
     2,-19,169
A7D7 49360 DATA 16,141,193,192,-19,96,162,8,7
     2
6Ø4Ø 49368 DATA 41,127,77,191,192,-19,141,191
     ,192,-19
D24B 49376 DATA 24,14,19Ø,192,-19,46,191,192,
     -19,144
D52F 49384 DATA 18,173,192,192,-19,77,19Ø,192
     ,-19,141
DCA6 49392 DATA 19Ø,192,-19,173,193,192,-19,7
     7,191,192,-19
6Ø32 494ØØ DATA 141,191,192,-19,1Ø4,1Ø,2Ø2,2Ø
     8,215
37C5 49408 DATA 96,13,8Ø,82,69,83,83,32
9A2A 49416 DATA 6Ø,82,69,84,85,82,78,62
AC9Ø 49424 DATA 13,13,13,Ø,48,49,5Ø,51
FE71 49432 DATA 52,53,54,55,56,57,65,66
Ø17E 4944Ø DATA 67,68,69,7Ø,Ø,Ø,-256,37944
```


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Peripheral Vision

By Jim Butterfield

RELATIVE FILE PROGRAMMING, PART TWO

In our previous episode, we took our first steps in relative files. We used direct commands (typed at the keyboard); this slowed things down. That made it easier to see the steps used in creating a relative file and putting data in it.

The same commands will work in a program, but we must be careful: a program can go too fast for the disk drive! We should take extra steps to pace the computer to the speed at which the disk drive can cope.

Rules So Far...

During our first session, we gave several rules for relative files. There will be more rules in a moment, but here's the list so far.

RULE 1

The first time a relative file is used, it must be made big enough to use more than one data block. A data block is 254 characters.

RULE 2

Any time you write to a non-existent record, you will create that record together with any lower-numbered non-existent records. That's how you create the first bunch of records in a new file, and that's how you make more if you need them.

RULE 2a

Don't be surprised when you get error advice from the disk drive when you position to a non-existent record.

RULE 3

"Empty" records contain a value of CHR$(255).

That's what the system puts there. If you want to set up a file with "empty" records, it makes sense to use the same value.

RULE 4

One PRINT# will write exactly one relative file record; no more, no less. Forget about sticking records together with Basic's PRINT# semicolon; forget about writing two records at a time by separating them with a RETURN character.

Let's add a fifth rule right away:

RULE 5

Forget about writing binary zeros to relative files. Binary zeros, or CHR$(0), are used by the relative file system to pad out empty space at the end of a record.

Quick Review

Coding was given for both the 64 and the 128. The Commodore 64 code, repeated below, works on all Commodore 8-bit machines and disks, including the 128.

The first direct command was to open the command channel.

```
OPEN 15,8,15
```

Then the new relative file was opened (and in this case, created) with this command:

```
OPEN 1,8,2,"Ø:TEST,L,"+CHR$(
25)
```

The length of each record on the file is set as 25 characters. Then we positioned to non-existent record number 12 (we calculated that we needed about 12 records minimum to satisfy rule 1).

```
PRINT#15,"P"+CHR$(2)+CHR$(12
)+CHR$(Ø)+CHR$(1)
```

The drive light blinks, indicating an error. We knew that record 12 did not exist; the "wedge" confirms this the disk status. We write a "null" into record number 12, which creates it (and incidentally all the missing records from 1 to 11).

```
PRINT#1,CHR$(255);
```

We are writing an empty record (see rule 3) into record 12. The missing records, 1 to 11, will be created.

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After that, we moved to various record positions in the file and wrote data there. For example, we went to record 7 with:

```
PRINT#15,"P"+CHR$(2)+CHR$(7)+CHR$(Ø)+CHR$(1)
```

...and wrote data there with a following:

```
PRINT#1,"LUCKY!";
```

We explored rule 4 by writing to a few selected records:

```
PRINT#15,"P"+CHR$(2)+CHR$(2)+CHR$(Ø)+CHR$(1)
PRINT#1,"DOUBLE";
PRINT#1,"OR NOTHING!"
PRINT#15,"P"+CHR$(2)+CHR$(9)+CHR$(Ø)+CHR$(1)
PRINT#1,"HOT"+CHR$(13)+"DOG!";
```

Finally, we closed the file with CLOSE 1, following which we closed the command channel with CLOSE 15.

A brief reading program was supplied. Now we'll write a more detailed program to read and write our relative file.

Re-opening a Relative File

Once a relative file has been created, you may open it with a simple:

```
OPEN 1,8,2,"Ø:TEST"
```

No need for the ",L," part, or to specify the record length. If you choose to include the length data, you MUST get the length value correct.

RULE 6

To open an existing relative file, you don't need to specify the record length; if you do so, be sure to get it right.

Since we cannot do INPUT# with direct statements, we must write a program to do this. Start by opening the command channel, then the file.

```
100 OPEN 15,8,15
110 OPEN 1,8,2,"Ø:TEST"
```

This time, we'll ask the user to type in a record number, following which we will show the contents of that record.

```
120 INPUT "RECORD NUMBER (Ø=END)";R
130 IF R=Ø GOTO 500
```

Record numbers are sent to the disk drive over the command channel as two bytes. So we must split the above value R into two parts, high (R1) and low (R0). By the way: always position to the first byte within the record.

```
140 R1=INT(R/256)
150 RØ=R-R1*256
160 PRINT#15,"P"+CHR$(2)+CHR$(RØ)+CHR$(R1)+CH
RS(1)
```

There could be an error; we *must* read the disk status. Time for a new rule.

RULE 7

You must read the disk status after a Relative file positioning.

We didn't follow that rule in part 1. But at that time we were typing direct commands at the keyboard. Read on.

```
170 INPUT#15,E,ES
```

The obvious reason for doing this is to find out the disk status (does the record exist, for example?). But there's an even more important reason for the status check: it gives the drive time to position the record properly. The status response will be delayed if the disk needs to do extra work to position to the selected record.

Vital Delays

This is important. For full-speed programs, not slowed at all by keyboard input, we need to add another rule. Reading data before the buffer is ready is deadly; but the real killer is writing data to a buffer that has not finished its other work.

Our first exercise worked at "human" speed. We could never get ahead of the drive. Our new program will also be "paced" by the fact that we can't thump in data at full speed; the keyboard still acts as a brake. But for general use, here comes another rule.

RULE 8

Except where records are being read in sequence, it's a good idea to give each positioning command twice, pulling status each time.

So, optionally in our case, you may add two more lines repeating this last activity.

```
180 PRINT#15,"P"+CHR$(2)+CHR$(RØ)+CHR$(R1)+CH
RS(1)
190 INPUT#15,E,E$
```

The program's next action is to determine if an error has indeed been received; if so, the error is certainly that the record does not exist. If so, the program should say it.

```
200 IF E<>Ø THEN PRINT E;E$ : GOTO 300
```

If there was no error, we may read the record. INPUT# will do the job. This command stops reading data if either: a RETURN character is encountered on the file, or an end-of-file condition is seen. But that EOF (end of file) has a twist to it:

RULE 9

EOF (End-Of-File) is signaled at the end of every record. EOF is in ST, the Status variable.

In other words, if we DON'T see a value of 64 in ST after a read, we know there is more data within the same record. In contrast to other types of file, ST does NOT indicate end of file, despite the EOF designation. (How do you find the end of a relative file? By positioning to a record and getting a DOES NOT EXIST response).

We'll use some fancy code to show multiple fields in a record, if any.

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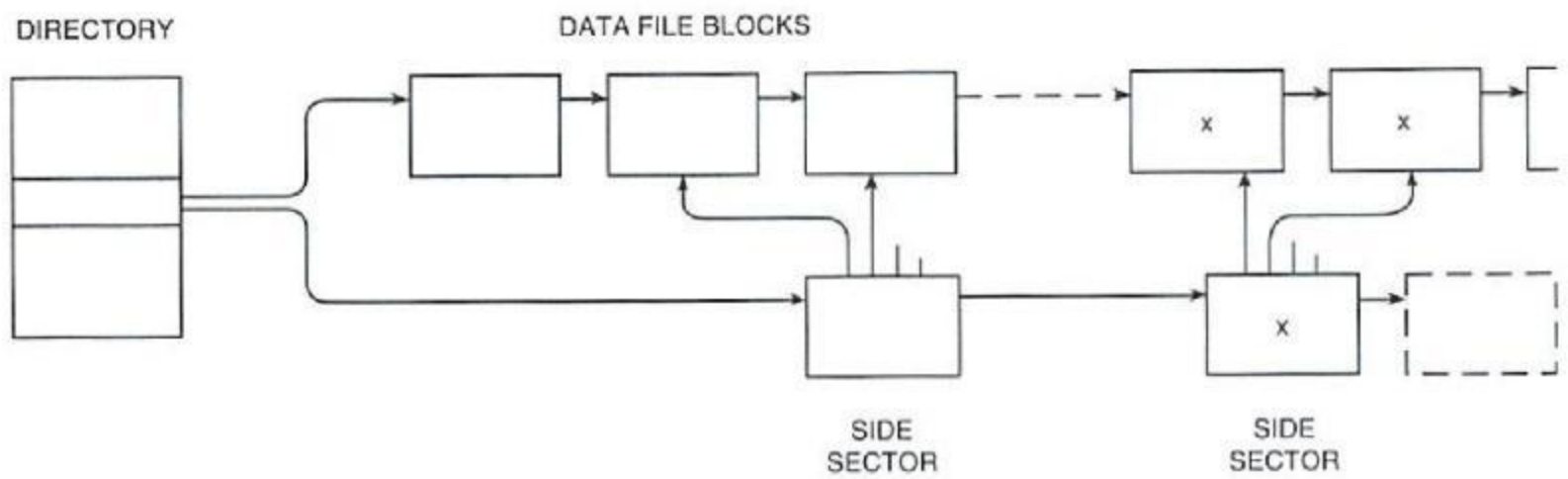

Figure 1. Any time a relative file is open, three buffers are active in the disk drive RAM: two for the data, and one for the indexing "side sector". A record might lie across (or span) two data blocks. It's important to realize that after a write operation, up to three blocks must be written by the operating system to the diskette.

```
210 M=0
220 J=0
230 INPUT#1,X$
240 IF ST=0 THEN M=1
250 PRINT "RECORD";R;
260 IF M=1 THEN J=J+1:PRINT "FIELD";J;
270 IF X$=CHR$(255) THEN X$=" <EMPTY> "
280 PRINT ":";X$
290 IF ST=0 GOTO 230
```

Reading and Writing

Now that we have positioned to the requested record (whether it exists or not), we can ask the user if a write is desired.

```
300 WS="N"
310 INPUT "WRITE TO THIS RECORD";WS
320 IF WS<>"Y" AND WS<>"YES" GOTO 120
330 PRINT#15,"P"+CHR$(2)+CHR$(R0)+CHR$(R1)+CH
R$(1)
340 INPUT#15,E,E$
```

If the record does not yet exist, we'll get an error signal once again; but we pull status mainly as a brake. For writing data, we won't bother with the complexities of multiple fields. We'll just ask for a chunk of data and store it into the record.

```
350 INPUT X$
360 PRINT#1,X$;
370 GOTO 120
```

The wrap-up code is simple. Just close the file.

```
500 CLOSE 1
510 CLOSE 15
```

Rules for Speed

The above program will work satisfactorily, but it still doesn't go at maximum speed. Each activity is slowed by the fact that it calls for human input.

Many programs bang away at full speed, reading and writing relative file records at high rates. For these, we must add extra rules to make sure that the data is safe.

Why the extras? They are there mostly because relative files are complex, and the disk drive needs to handle them with great care. A relative file uses three buffers: two for data (remember that a relative record might "span" across two disk sectors), and a third for the "side sector" index. (Have a look at Figure 1 for a visual representation of this).

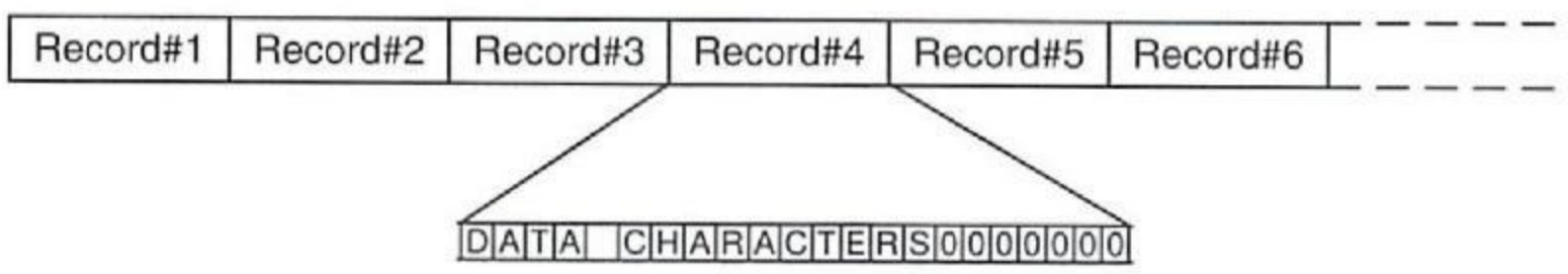

Figure 2. Each record of a relative file consists of a fixed number of characters (22 in this illustration). If the record doesn't need all the space, the remainder is filled with binary zeros. Thus, the actual data in record 4 is only 15 characters, with seven binary zeros occupying the remaining space.

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If a program has just written a record and now wants to move to a different one, a lot of work must take place within the drive. First, the record we have just "written" has not yet been put on the disk; it's still in RAM buffers. So the drive needs to write up to three blocks before it can shift its pointers and look for the different record.

Rules 7 and 8, shown above, call for reading status twice whenever a program wishes to position to a new record. That covers most reading problems. When we write records, we add new protective rules.

RULE 10

Unless records are being written in strict consecutive order, it's a good idea to follow any record writing action with a command to position to record 1.

Such a "backward" positioning forces a write to disk, which is an extra safety measure. We could add this step to the program above with the lines:

```
370 INPUT#15,E,E$
380 PRINT#15,"P"+CHR$(2)+CHR$(1)+CHR$(0)+CHR$
(1)
390 INPUT#15,E,E$
400 GOTO 120
```

The status variables E and E$ could of course be tested to see if any errors were reported. Remember that reading the status is there partly to restrain the speed of disk activity.

One final precaution can be taken for maximum data security. After a record is written you could close the file; this would force all disk sectors to be written. The file can be opened again right away, of course. This is quite slow, but it can provide assurance that the file has been written properly.

RULE 11

Unless records are being written in strict consecutive order, you can get maximum security after writing a record by closing the file.

This extra security could be added to the program above by coding:

```
370 INPUT#15,E,E$
380 CLOSE 1
390 OPEN 1,8,2,"0:TEST"
400 GOTO 120
```

Some Final Comments

RULE 12

When reading or writing records in strict sequence, you may ignore rules 8, 10, and 11.

If you are skimming through a relative file to build an index, or perhaps copying data into a new relative file, this rule can save you a lot of time. Records handled in sequence will always be properly handled by the disk drive.

RULE 13

Even though the last character of a "position" command seems to suggest you can write part of a record, don't. Write the whole record, all fields, as one shot.

I'm not sure why it is, but writing a "partial" record always causes a mess.

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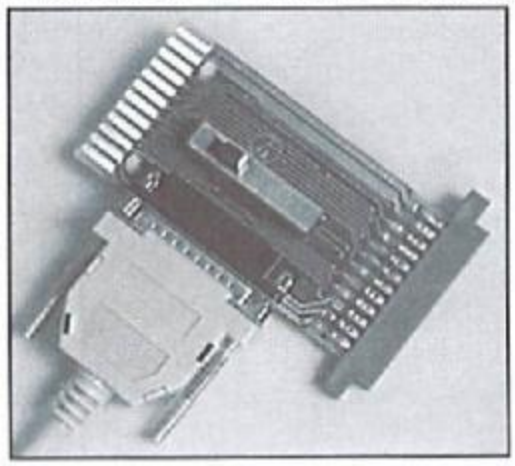

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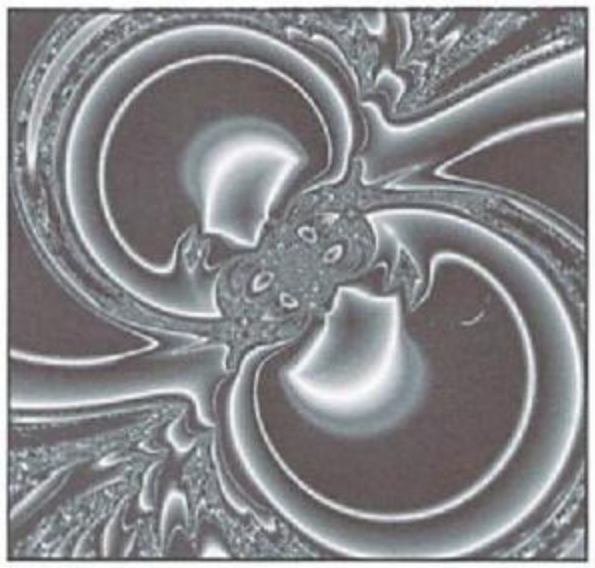
Carrier Detect

By Gaelyne R. Moranec

LONG DISTANCE RUN-AROUND...

Getting connected with your modem can be especially challenging if you live in a rural area, as often there aren't any Bulletin boards or local access numbers for the online services. The first question you might wonder is, "How do I find numbers that I can call with my modem?". That may well be followed by, "I'm not going to go broke calling long distance, am I?" If this is your situation, you may find you will need to dial long distance to connect *anywhere*. A very long time ago (before I knew better) I scoffed at the idea of ever dialing long distance with my modem. I've since learned that there are times when the benefits outweigh the cost. There are ways to keep the costs down, however.



Finding BBS and Online Service Numbers

Usually your local users group will have a newsletter which might list local bulletin board phone numbers, or you can find BBS numbers in magazines such as this one—I counted 5 in Issue #6 without even looking very hard at all. There are magazines which cater to BBSing, such as BBS Magazine or Boardwatch that also supply BBS phone numbers. Once you find one or two numbers you can usually find more, as many bulletin boards themselves list other BBS phone numbers. Yet another often overlooked source of information, is the local computer repair shops. True, they may not service Commodore computers, but they may know of area BBS phone numbers. You can call just about any type of BBS or Online service whether it's run on a Commodore, PC, MAC, Amiga, or mainframe with the exception of those which use graphic interfaces, such as America OnLine (AOL) or Prodigy.

If you are looking into connecting to an online service, most offer an "800" number to dial with your modem so that you can start up with the service. Once you've setup with it, you are usually given the phone numbers you can dial which are in your area code. You can also dial the "800" customer (voice) number for most places to learn about local access numbers or possible alternatives if you live in a rural area. Speaking of "800" numbers, there ARE bulletin boards and online services that offer this as a feature to use, but you are billed extra for it every time you use it. Compare the costs with dialing a long distance access number so you can determine if you are saving or losing money by using such this type of feature.

Some of the latest PC BBS software have options which allow users to connect to the Internet via the BBS. The advantage is the ability to combine regular BBS usage (such as games or use of QWK mail doors for offline mail reading) with the ability to access Internet features such as Telnet, WWW or FTP. The disadvantage is that these are usually not free bulletin boards. You are either charged by the hour or are charged a set amount each month and then allowed a specific amount of time to use the service each month.

Long Distance With No Run Around...?

Remember the old "gas wars" where every gas station seemed to compete against each other, lowering their prices and offering incentives to frequent customers? I too, wish those days would return... but in the meantime, if you happen to own a television and have it on once in awhile, you might have noticed that the various long distance phone companies are in fierce competition. I don't and can't recommend any one service. What I do recommend however, is that just as you would with any other item that you choose to purchase such as a modem, check out all of what's currently available and then compare the options while keeping your actual phone usage in mind.

Comparing long distance phone services is not always easy. Some companies bill by the minute (AT&T, Sprint, MCI and others) while others bill by a set number of seconds (usually 6, but it varies). This makes it difficult to compare, and in some ways easier for a company to make it sound like they can save you more than the others. Use a calculator if necessary to find out what you would be billed per minute for comparison purposes. Also keep in mind when you phone the various LD carriers that their "customer representatives" are first and foremost salespeople. It is their job to convince you that their particular service is better than the others. In researching this article I also found that some use the "STANDARD" rates of the competition

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to compare to the "ECONOMY" rates they offer. Pay attention and buy nothing until you have the statistics from all the services before making a choice. Of special interest, if you ask about a service you know the carrier offers, but are instead told about another "newer" "better" (etc) offer stick to your original intent and find out the actual rates for what you asked about, then listen to the spiel on the "newer" "better" offer. It can be eye-opening. All long distance carriers offer some kind of special offer or plan, and it pays to know what each one is all about.

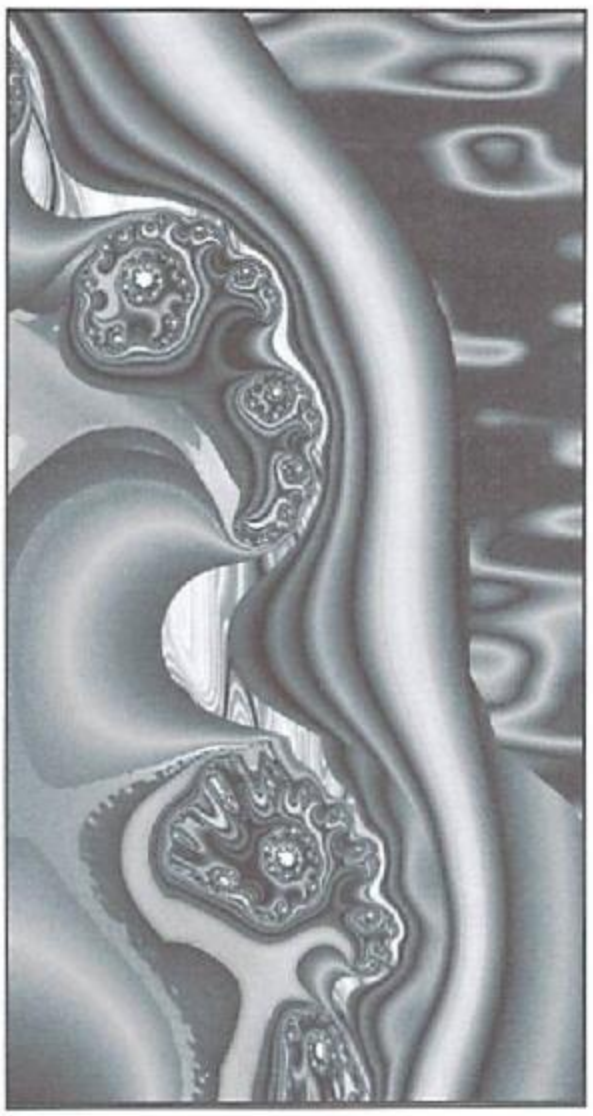
AT&T has a plan called "Reach Out America" in which you are "pre-billed" at a set rate for an hour or more (depending on what you request) of long distance service per month. Since you are pre-billed, you have already paid for the long distance before you use it, up to the amount of time you've been billed for, so if you don't use this time it's money wasted. It can be very economical if you do use this time but don't go over the time you've already paid for (as then you are billed at a higher rate). It's designed for calls only within the United States, but they do have have a Reach Out World calling plan also. The latest special from AT&T, "True USA" which gives a 25% discount on all calls if you happen to spend from $10-30 in a month, and raise the percentage if you spend $50 or more. This sounds good in theory, but the catch is finding out what the actual rate you are being billed at before the discount and then figuring the rate with the discount so you can compare the rates you are charged with other LD carriers.

MCI now offers "PC Connect", which is tied in with their new "Friends and Family II" service. Essentially you sign up and tell them what BBS, online service numbers, or other (voice) long distance numbers you you intend to call on a regular basis, and they offer 14 cents per minute daytime rates down to a low of 7.5 cents per minute for late night and weekend calls to these numbers.

In conjunction with this, MCI offers BBS sysops a deal that if the BBS has an advertisement for the PC Connect, giving a unique code number for that particular bulletin board and you give this code when signing up, the Sysop of the BBS receives $5 off their bill, per each person who signs up with their code. Any place you call which is connected with MCI earns an additional discount. The PC Connect plan from MCI allow up to two International phone numbers, with a slightly higher rate per minute.

There is some fine print to this, however. These rates are not permanent. These rates are in effect for only the first six months you are enrolled with the plan. After that it drops to 25%, which means the rates given above go up by 50% after six months.

Sprint has a plan called "Most" which gives you 50% off two long distance numbers you've phoned the most during the month. If you are only phoning one or two long distance numbers in a month this can add up to a nice savings, but even this has some caveats. For instance, you



receive this rate of 50% off for only four months. After that, it goes down to 25% each month. Other bonuses are offered at that time to keep your service with them. Another consideration is the actual discount is commensurate with your usage, which means that if you phone only one BBS long distance a couple times a week with a high speed modem to download a mail packet, the savings might not be all that great in comparison with other plans.

However, if you have to phone long distance to connect to an online service and this is the only long distance service you phone, the savings may well be far greater than what you would get from other services. Sprint's latest plan is "Sense" which is only for calls within the USA. It gives 10 cents per minute from 7pm to 6:59am week nights and weekends.

There are smaller LD carriers that allow you to keep your present long distance carrier and access them by dialing a special number before you dial the actual phone number. These companies offer discounts at specific times and/or discounts for calling a specific number of miles away. One such company offers the "service" of monitoring your calls and then checking the rates between all the available LD carriers in the area and then billing you at the least expensive rate. This type of service may be useful, but the trick is to REMEMBER to dial the number for this service before making your call.

Other Hints and Tips...

Keep in mind that sometimes calling out of state can cost less than if you call within your state or area code. "Closer" doesn't always mean "cheaper" when it comes to long distance.

Find out when the "cheap" or economy rates are in effect for each long distance carrier, as these are not always standard times. Some start or end an hour before or after others do. For instance, one company may start their weekend discount rates at 11pm on Fridays while another's weekend discount rates begin at 12:01am on Saturdays and end at 5pm Sunday. If you are phoning internationally (yes, some people really do this, I'm one of them), find out the discounted times for the country you call for EACH long distance service, as they are not all the same. One company may have the most expensive rates for a time period that many of the other companies offer their best discount rate, and if you don't know this time slot it can be expensive.

This brings me to another point. Your phone bill. You don't have to blindly accept what it says, especially if it doesn't seem correct. Mistakes can and do happen, and the long distance carriers are in such fierce competition that if you are savvy enough to point out their errors (or at least question what doesn't seem right), that they do refund for incorrect billing or mistakes made by their service representatives when signing you up as a subscriber.

In the last six months, I've had over $300 refunded back to me due to errors the LD carriers have made on my bills. The first was because the company's representatives neglected to tell me the correct time slots for the best discounts and I had been under the assumption that it was the same as other services. I argued that if I had been told these time periods, I surely would have phoned during those times. I won the argument—retroactively to my first bill with the carrier. The second time I received a refund was because my list of MCI PC Connect phone numbers was incorrect in MCI's database, the last digit had been left off of a few of the numbers and because of this my bill didn't reflect any discounts for

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these numbers, which happened to be the ones I phoned most often. MCI also gave me a refund, retroactive to when I began to use their service. In both instances I didn't have to go through any major hassles, all it took was a phone call with my bill in hand for reference.

You might have noticed that I mentioned using more than one LD carrier. There's no rule that says you have to stick with the same company and often times it makes good sense to check out what the others have to offer. Most carriers will send a "check" good only for the local phone company to cover the cost of switching your service, and many times, due to stiff competition, they offer other incentives such as $20-$40 off your phone bill for the first month. It can actually pay to switch with some of these offers, but you really have to find out the details. One company may send a "check" for the local phone company for the entire amount, another might prove more annoying by sending several of these with dates on them that are only good for a specific month and it's up to you not to misplace them and to remember send them in with your bill during the appropriate month.

Really Off the Wall Stuff...

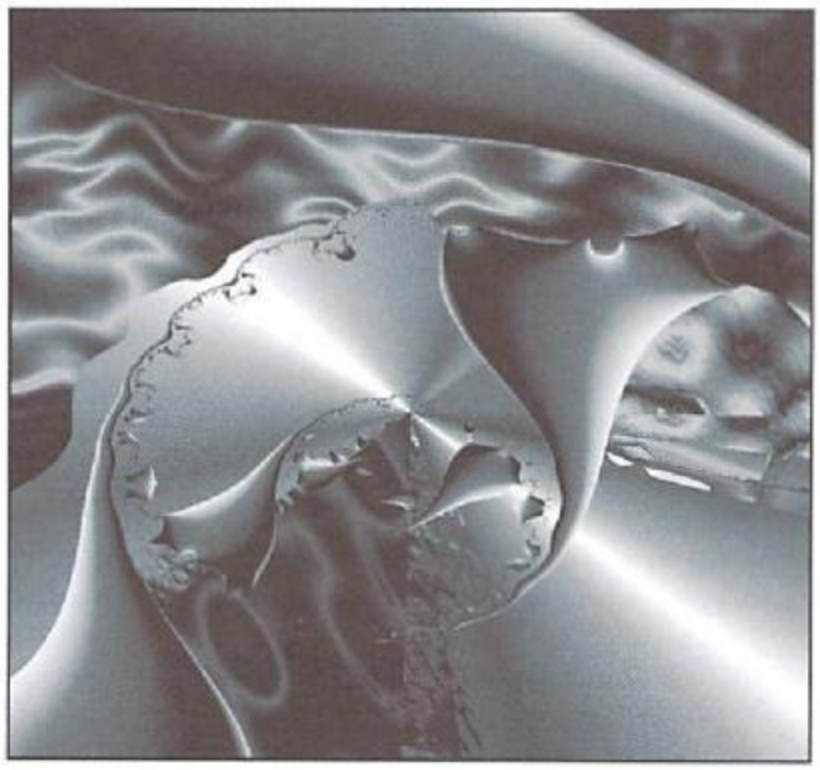
Recently various newsgroups of the Internet have been hit with various phone "spams". These are not necessarily "scams", per se, but they are annoying. On the Internet, a "spam" is where many newsgroups are bombarded with an advertisement or otherwise inappropriate message for the type of discussion of the newsgroup. They are very much frowned upon as they waste a great deal of money for everyone. The phone spams generally offer high discounts for phoning long distance or internationally.

Many will require pre-payment, which personally, I would be very leery of, as the pre-payment is usually a much higher sum than my phone bills. Before signing up for such a plan I would check with the Chamber of Commerce nearest to the company, as well as the Attorney General for the state in which the company does business.

Although it's not something that can be used (yet) in telecommunications, something you will likely be seeing in the near future are "Phone Cards". These are not the same as the "credit card" style cards the long distance carriers have been mailing out over the last few years. Instead, Phone Cards are essentially pre-paid long distance phone calls which are bought in varying amounts ($5, $10, or $20) and are used in pay phones designed for their use. A display on the pay phone shows how much money you have used from the card and how much you have left available on it. In other countries these cards are sold in gas stations and discount stores.

As mentioned above, there are some carriers that allow you to keep your present long distance carrier, but offer discounts if you dial their "code" before you place your actual phone call. This nice with a phone that has memory—the type that allows you to pre-program the phone's buttons and then dial numbers by pressing a button. But you really don't need to buy a phone like this. You can use your Commodore, modem and term program for this "feature".

Simply have a separate phonebook in your term program for your voice phone numbers (local or long distance) and let the modem dial the phone for you. To dial out, let the modem dial the number, then when you hear a ring, pick up the handset of your telephone and press the appropriate key on the computer (depending on the term program) to stop the dialing process. This is also great for calling places that are constantly busy (such as call-in radio contests) since the modem can redial the number faster than you can manually.



Call-waiting, the service which gives you a beep to tell you that you have another call coming in, is not something you want or need when you are modeming as it causes your modem to become confused and drop carrier. There are two ways to temporarily disable this feature from within your term program, depending on the program you are using. The EASIEST method is if the term program has the option which lets you define a "Dial String". Normally this would be "ATDT" for touch tone phones, or "ATDP" for pulse or rotary style phone lines. If want call waiting disabled for each call, find this option in your term program and change it to "ATDT*70WDT" for touch tone phones, or "ATDP1170WDP" for pulse style. This tells the modem to first dial the code to disable call waiting (*70 or 1170), wait for a dial tone, and then start dialing the number in the phonebook entry. If the term program doesn't have this option, then you will need to add "*70WDT" or "1170WDT" in your phonebook before each phone number. It would look like "*70WDT555-1212" in your phone book.

If you find yourself doing a lot of modeming, getting complaints from family, relatives or employers about your phone being busy constantly, or much much worse, agonizing that you can't call your usual haunts with your modem because you're waiting for a phone call, or have to wait for someone to get off the phone so you can use it, consider getting a second phone line. The cost of a second phone line in comparison to the cost of the aggravations mentioned above may well prove worth it, depending on your modeming habits. Second phone lines (often called "Data" lines when you have a modem connected to it and use it only for telecommunications) can be quite convenient you can even can order a pizza on the voice line while modeming on the other!

Wrap Up...

The long distance carriers change their plans frequently. Even more confusing is when they keep similar names but change the rates and discounts offered. Along with these changes, over time your phone and modem usage can change. If you're trying to keep your costs down, be sure to shop around and compare the rates of other long distance carriers every once in awhile. It used to be that like the electric company, you only had one phone company and that was the only one available to you. Many people get stuck in the mindset that once they have a long distance carrier, they should keep it. Many of the larger companies are counting on this mindset from you the consumer, and hoping that you'll stick with them once you've signed on, out of "brand" loyalty. From what I've found, the longer you're a customer of only one service, the less discounts you receive over all. It is certainly not a case where the longer you keep a service the better your discounts are. Shop around and find what works for you.

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Over The Edge

by Harold Stevens, Jr.

Okay, okay, I'll admit that I am hooked. But I am not the only computer user who is addicted to my modem. Ever since I purchased my Aprotek Minimodem-C and went on line about six years ago, I haven't been able to keep from telecommunicating with my computer. Nothing could keep me away from those long gone exotic Commodore boards like "Iron Tower," "Enchanted Mountain," "64th Precinct," "Stairway to Heaven" and "Asgard" that used to be in the Columbus, Ohio, area. Just about every other computer user around here and I cut our modeming teeth on these Image and Color 64 boards before going on to the bigger IBM boards and national ones like GEnie, Delphi and Compuserve.

For a long time I debated between joining Quantum Link or Compuserve. I settled on Q-Link as it fit my budget and it was specifically created for Commodore computers. Besides, I had two Q-Link logon disks on hand; one that came with my computer and the other with version 2.0 of GEOS I had purchased.

I primarily used Q-Link to download software with my free hour, staying away from the People Connection after hearing horror stories that you can very easily rack up big bills talking to others for a long time. If the amount of time I spend each week posting on the local BBS is an indication of how long I would possibly be on Q-Link's People Connection, I would probably go bankrupt.

Of course, I am beginning to see that happen now whenever I get on the Commodore Round Table Conference on GEnie, and my monthly bill becomes more than the $8.95 for my four free hours. But it's easy to get hooked, particularly when you are yakking away on the keyboard with your fingers chatting with other Commodore users.

At first I used to be on the modem for about three to four hours per night, three to four nights a week. This really irritated my wife, particularly when she tried calling home from work and couldn't get through in the evenings. So, she

placed a time limit of one hour per evening or she would confiscate my modem.

Reluctantly I agreed, but only after she made the point that if she or somebody else had to reach me in an emergency, they wouldn't get a hold of me because I had the phone line tied up. So, I began to curb my modeming addiction in the evening, going along with the time limit and started making my computer calls early in the morning. And guess what? I found that I could get on the boards a lot easier between 6-10 a.m., as most of the usual modemers and hackers were still in bed asleep.

Next came the demise of the Commodore boards locally, which fell to the wayside as their sysops abandoned the Commodore 64/128 computers, moving on to either Amigas or IBM clones. Some of those who went to IBM-clones restarted their boards again under the same names, while the others suffered sysop burnout and dropped out from the BBS world altogether.

Soon after becoming an expert at using Color 64 and Image, I had to learn how to adapt to the new IBM-clone boards. Even the Punter 64 system that the user group (which I was a member of originally) started out on its BBS which gave way to the computer evolution and became a Punter PC board. The transition to the IBM boards, however, was not hard. Many of them use the same type of sub-board command codes found on many of the ASCII type non-IBM boards, such as those on Atari, Apple and other Commodore boards.

Quickly I learned these IBM editing commands and became as adept as those who have been doing the PC scene for a long time. My only limitations were those imposed by the term program that I was using. But that didn't matter, as I was still having fun posting my usual remarks and comments for all to read.

Seeing these Commodore specific boards fall to the wayside didn't really bother me at first. After all, I still had Q-Link. Yeah, right. As soon as I muttered this, all the signs were being posted on the wall that Quantum Computer Services was slowly packing up its Commodore toys and getting ready to leave as well.

I had the feeling that when RUN magazine folded and its software had started to disappear from Q-Link that something was afoot. Then we watched Commodore Business Machine slip out the back door, finally letting us C-64/128 users know that we weren't wanted by them anymore. The next blow came in January 1993 when Q-Link would not validate the new software being uploaded by its members. The knockout punch came a couple of months later when geoWorks (formerly known as Berkeley Softworks) withdrew its support and the GEOS section of Q-Link disappeared.

That was when I finally got fed up with Q-Link and placed the phone call to tell them to take a hike. A couple of weeks later I got this nice little form letter from Steve Case, the head of Quantum Computer Services, inviting me to come back to their fold over at America Online. Of course, this meant I would have to go out and buy an IBM clone or an Apple Macintosh first. Sorry, Stevie, no can do. I'm not going to buy a new computer just so you can line your pockets with my cash.

What I did instead was to look at GEnie and Delphi. While Delphi looked good with its offer of more time for the dollar and access to Internet, I went with GEnie due to the fact that its

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Over the Edge *(continued from previous page)*

Commodore section was bigger and the big names of the C-64 universe hung out there. Compuserve was still out of the question due to the fact that it cost too much for my budget.

Once I signed on to GEnie, I was in seventh heaven again. Here I found lots of public domain and shareware software that should have been on Q-Link in the last year that I was there. Not only that, but I discovered that many of the Commodore users had "defected" there as well, and the support for the C-64/128 was very well established with people that I already knew from Q-Link. People like Steve Vander Ark, Maurice Randall, Doug Cotton and a few others.

On top of that, GEnie also had other areas that I was interested in such as the conferences on photography, journalism, scale model building and Star Trek. I can't recall ever seeing such professional and hobby topics on Q-Link. Modeming became both fun and useful once again.

Of course, locally, it's a different story. While I miss having Commodore bulletin boards around, I still enjoy the IBM boards that I am on. A couple of them do have Commodore software on file for downloading, while others have Commodore conferences in their message subs linked to other systems via networks.

But more importantly, my old modem buddies are still around and we continue to enjoy each others company despite what kind of computers we own. And that's what modeming is all about.

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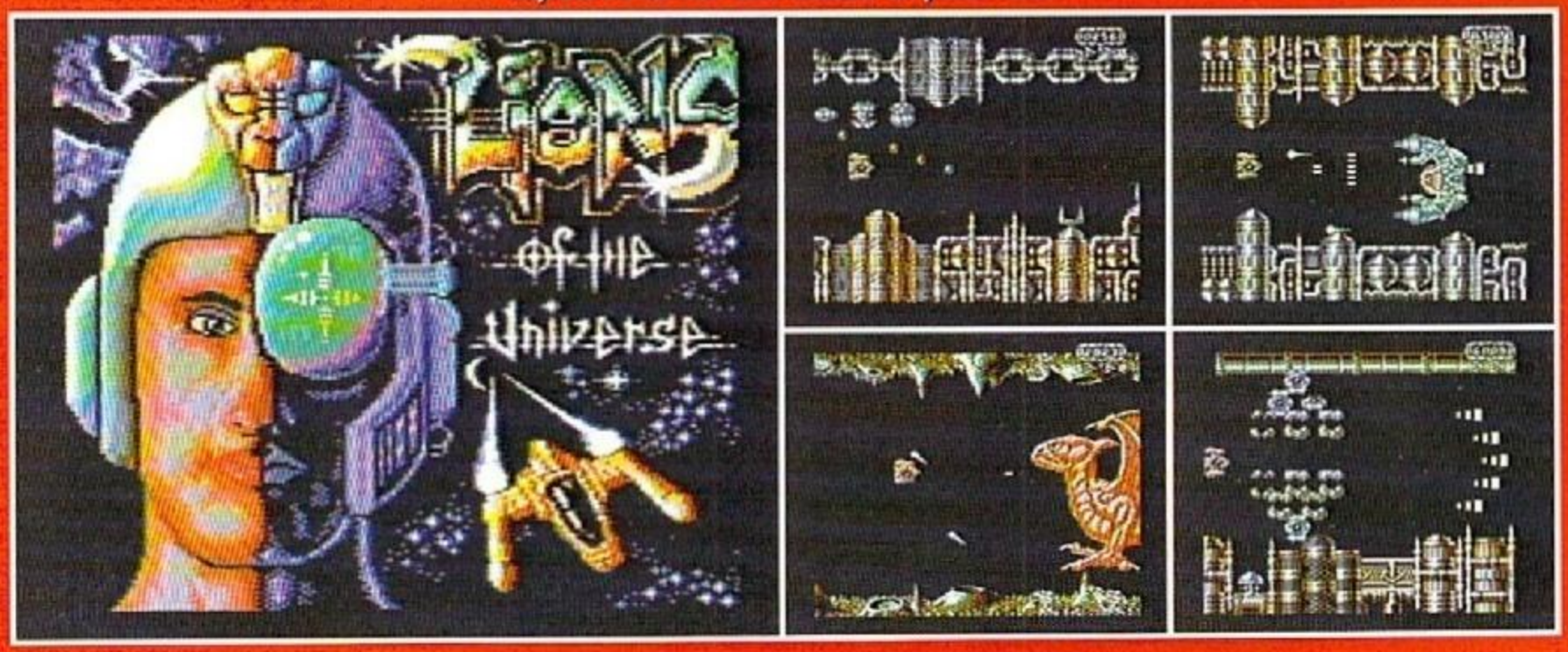

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